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Original Communications.

*HYGIENIC THERAPEUTICS—A LECTURE ON MASSAGE.**

By Professor Dujardin-Beaumetz, Paris, France.

GENTLEMEN,—I desire to devote two lectures to massotherapy, and I shall follow in these lectures the order which I adopted when treating of kinesitherapy. In the first lecture I shall give a historical survey of massage, and shall study its modes of application and its physiological effects, and I shall devote the second lecture to its therapeutic uses.

The word *massotherapy* may appear to you somewhat strange, I fear even that it may seem uncouth, but it is sufficiently expressive of the meaning which I attach to it, namely, the application of massage to therapeutics. Moreover, writers have protested against the use of the word *massage* itself, and Dally rejects it altogether. He would have us give to the sum of therapeutical means included under this term the name of *manipulations*. But it seems to me idle to waste disputation over the grammatical validity of a word which is now in good medical usage, and I pass on to the consideration of my subject in its historical aspect.

* An abstract of two lectures delivered in Cochin Hospital, and translated from advance sheets by E. P. Hurd, M.D.

On this part I shall be brief, for the history of massage is in many points inextricably blended with that of gymnastics, and if it behooved me to treat the latter subject with a fair measure of completeness, I have only to refer you to details in my first lecture, which equally concern massotherapy. There are, however, particulars in this history which deserve to be put in clear light, and to this task I shall now apply myself.

We find among almost all nations in the most remote periods of their history practices of massage in common usage. Review the writings of the principal navigators, consult in particular the narrative of Captain Cook, and you will see that in Tahiti, in New Holland, and other parts of Oceania, the primitive people employ the practices of massage for the treatment of diseases, and the means which they make úse of are the same as those which we now employ. Thus, in the island of Tonga, in Oceania, under the name of "*toogi-toogi*," the natives have a medical practice which consists in prolonged and gentle percussion with the fist, and under the name of "*miti*," or "*fota*," they mean the kneading of muscles and frictions. In New Holland the same custom prevails, and it is chiefly the sorcerers, the *Mulgaradocks*, who practise these manœuvres of massage. Interrogate also the travellers of Central Africa, and they will tell you that among the inhabitants of the African continent the sorcerers practise the same pressures and the same rubbings.

Moreover, these rubbings and these pressures are, so to speak, instinctive, and whenever an individual suffers in any part of his body, he endeavors by these manœuvres to get rid of his pains. It is not surprising, then, that we find these methods in vogue from the very dawn of human history, and that we also see traces of them in the current medical practices of all nations, though modified according to climates and according to temperaments.

While in the East, where the cutaneous circulation is very active, and where there is a necessity for ridding the skin of all impurities resulting from the excessive performance of its excretory function, the most popular methods are gentle frictions, scratchings, kneadings, associated with vapor-baths, such as are put in usage in the Moorish or Hamman baths which are found in abundance throughout the entire East, among the people of the North, on the other hand, there is an indication to invigorate the circulation, to habituate the skin to undergo sudden transitions from one temperature to another, and this is the benefit sought from vapor-baths, cold-water baths, and flagellations, such as characterize the Russian baths.

Moreover, we find in our own times "survivals" of primitive massage practices in the manœuvres resorted to by bone-setters. Before massage, as of late years, took a definite scientific character, these bone-setters were quite in repute as performers of massage, and it may be safely said that there is scarcely a populous locality, or even obscure hamlet, in France at the present day where some of these "natural bone-setters" do not exist to be a thorn in the flesh to the regular practitioner.

But while on this subject of massage from a purely scientific stand-point, it may be stated that in the Chinese book "*Cong-fou*," of which I spoke to you in the first lecture, we find an exact description of all the practices of massage. You will even find there an account of those concentric and excentric movements, which, according to Meding, constitute the basis of Swedish gymnastics. The engravings, moreover, which accompany the "*San-tsai-ton-houi*," show us how the Chinese practise massage.

In India, rubbings and percussions are also in popular usage, and Anquetil and Petit-Radel have insisted on this point. The Hindoos, besides making frictions with the mud of the Ganges, rub thoroughly and knead the muscles, an operation to which they have given the name of *chamboning*, which the English have translated *shampooing*, and which every barber knows how to apply so vigorously to the heads of his customers.

It can easily be shown that the Greeks and Romans were also in the habit of employing massage. Among a thousand equally pertinent examples I may cite this observation of Hippocrates: "At Elis the wife of a gardener was seized with a continuous fever; she took evacuant remedies without any relief. In the belly, below the umbilicus, there was a hard swelling, protruding above the level of the surrounding parts; this swelling caused violent pain. *The attendants were set to rubbing and kneading this tumor with all their might, their hands being well smeared with oil.* Soon blood in abundance was passed by stool. The patient experienced marked relief, and got well." Here, you see, was a case of intestinal obstruction, and massage overcame the obstruction and effected a cure. Oribasus, also, in his compilation, indicates all the practices of massage, giving the minutest details.

The RENAISSANCE, it must be admitted, added little to what the ancients knew respecting massage. I ought, however, to mention a curious tract by Paullini, which appeared about the end of the seventeenth century, and was entitled "*Flagellum Salutis.*" The same subject was taken up a hundred years later (in 1795) by Meibomius, under the following head: "*On the utility of flagellation in medicine, in the pleasures of marriage, and in the functions pertaining to the loins and kidneys.*" This title leaves no doubt as to the benefits which these two writers ascribed to flagellation in the treatment of certain affections, and in particular of frigidity.

As I have just told you, the practice of massage remained almost exclusively confined to the lower classes, being abandoned to the country quacks, and it is only within a few years that massage has obtained the right of domain in medicine. This movement of scientific renovation took place almost simultaneously in France, in Holland, and in Germany.

In France, in 1837, Martin represented to the Medical Society of Lyons the marvellous results which he had obtained from massage in the treatment of lame back and lumbago. Lebatard and Ellaume in 1860,* Rizet in 1862,† showed the advantages which may be obtained from massage in sprains; but we must come down to the thesis of Estradère in 1863‡ before we find a comprehensive treatise on the effect of massage. Works on this subject have since multiplied, and I cannot even give you a full list of their titles, but I cannot refrain from indicating the great value which I ascribe to the brilliant work of Estradère, who was the first to put in clear light the physiological effects of massage, and the therapeutic benefits to be derived therefrom. Nevertheless, it is not France alone that derived all the benefits of this work. Holland has reaped advantages from it under the influence of Mezger and his pupils, and we see even now patients flocking from all parts of Europe to Mezger's clinic to essay the effects of massage under the direction of that celebrated masseur.

Mezger has written but little. The only treatise of his which we possess (and it is of very modest dimensions) was published in 1868 at Amsterdam.§ He says in this work that it is his intention to devote himself particularly to those special applications of gymnastics which are called *frictions*, or, better still, *massage*. He adds that in 1853 he began at Amsterdam the treatment of sprains by this means; that little by little he improved his system, and that since 1861 he has occupied himself exclusively with massage. Mezger has gathered around him numerous pupils.

In Sweden, it is under the influence of Berghmann, of Helledag, and especially of Amström, that the method of Mezger has spread. In Russia, Berglind has been the pioneer in this direction.‖ Lastly, in France, we owe to Norström, of Stockholm, a complete exposition of Mezger's method.¶

In Germany, it is under the influence of Rosbach, of Busch, and particularly of Schreiber** and of Reibmayr, that massage has taken a truly scientific development. The work of Schreiber has been translated into French, and more recently still into English; Reibmayr's has been translated into French and annotated by one of my pupils, who has made a specialty of massage.††

The methods of massage are divided (like those of gymnastics) into two great groups,—massage without apparatus, and massage with apparatus. As for massage without apparatus, the only kind practised by Mezger and his followers, we have to distinguish four different manœuvres,—passes (*effleurage*), frictions, kneadings, and tappings.

Effleurage‡‡ consists in light passes made with the hand. Sometimes it is the palm which is used, sometimes the fingers, or, more properly speaking, the pulps of the fingers or thumbs, or even the phalangeal joints. In the latter instance the fist is closed, and it is with the extremity of the articulations of the phalanges with the phalangettes that the skin of the patient is rubbed. The Germans give to this kind of massage the name of *kammgriff* (combing).

The frictions consist, as their name indicates, in making with the hands centripetal

* Lebatard, *Gaz. des Hôp.*, 1850; Ellaume, *Gaz. des Hôp.*, 1859.

† Rizet, "On the Treatment of Sprain by Massage." Paris, 1868.

‡ Estradère, "On Massage: its History, its Manipulations, its Therapeutic Effects" (*Thèse de Paris*, 1863).

§ Mezger, "De Behandling von Distorsio Pedis met Fricties." Amsterdam, 1868.

‖ Berglind, "On Massage." St. Petersburg, 1875.

¶ Norström, "Du Massage" ("Méthode de Mezger en Particulier"). Paris, 1884.

** Schreiber, "Practical Treatise on Massage and Medical Gymnastics." Paris, 1884; Philadelphia, 1887.

†† Leon Petit, "On Massage, after the Method of Reibmayr." Paris, 1885.

‡‡ *Effleurage*,—i.e., *grazing, the hand being made as it were to graze the part.*

frictions, which are rendered rhythmical by alternating the movements of the hands.

Kneading is performed sometimes by pinching up a muscle, or by kneading it with the two hands, or, in another manner, by rolling with both hands the muscles of a region.

Tapping movements consist in tapping, slapping, or stroking certain regions. Slapping is made with the palmar surface of the hand, the skin being smitten more or less forcibly. Stroking is done with the inner border of the hand, with which the part on which one wishes to operate is percussed with greater or less force.

The apparatuses employed in massage are quite numerous, and I can only mention the principal. Sometimes the instrument is a simple affair,—the flesh-brush or glove, the *strigilis* or flesh-scraper (*raclette*), which we find employed in remote antiquity, as is seen in one of the masterpieces of ancient statuary. Then come the more or less complex rollers (*roulettes*), with which of late years electricity has been conjoined, as in Butler's roller, Stein's cylinder. Then there are the wooden mallets, the ferules, the battledoors, whose number and whose form are variable, and whose application goes back to the most remote times. It is even probable that the old proverb, *Se battre les flancs*, etc. (*about beating the loins*), had an allusion originally to the custom of smiting the sides of the abdomen with a wooden paddle or a leather thong.

Among these latter instruments I must mention the percussor of Sarlandières, and the dorsal beater of Klemm, and the more complex muscle-percussor, which he has also recommended. I must also mention in passing the electric percussors, moved by electricity, and devised by Granville, which give an absolutely rhythmical series of percussions, and lastly, the more complicated apparatus which Zander has invented, and which also determines more or less prolonged percussions and strokes of considerable intensity.

These apparatuses, however, are mostly abandoned, at least in France, and even by Mezger in Holland, and it remains for me now to discuss the two following points: first, the utility of fatty inunctions in conjunction with the practice of massage; and, second, whether massage should be performed on the naked body, or through a certain amount of clothing.

Estradère, without attaching any great importance to ointments and inunctions, regards them, however, as having a certain utility. Schreiber, on the other hand, denies that these inunctions are of any great benefit, and reserves them for special cases only. Mezger favors the use in nearly all cases of inunctions with some fatty substance, to which he would add some essential oil of agreeable odor.

I shall not reproduce here the many formulæ of ointments and pomades employed by the different medicasters. Every professional bone-setter has his particular formula, and, what is a little curious, it is not to the manœuvres which he practises, but to the ointment which he uses, that he attributes the effect obtained. This reminds me of a little incident in my own experience, when I was reporter on secret remedies to the Academy of Medicine. I had my attention called to a certain popular ointment, which was said to cure herniæ. But this is the way that the proprietor ordered it to be used: the hernia must first be rubbed with the ointment, then it was enjoined that a well-fitting truss, sufficient to support the hernia, should be worn after the rubbing. It is so with all these queer pomades which are in use by the different professional "rubbers,"—the inunction has no efficacy unless the accompanying massage is well performed. For my part, I believe that the use of some fat or oil is advantageous in facilitating the movements and passes (*glissements*) of the hand, and I am in the habit of employing vaseline aromatized with an essential oil.

As to the question whether massage should be practised on the denuded skin, Schreiber recommends its performance through a thin flannel wrapper, and, in support of this, appeals to considerations of propriety and modesty. I think, however, with almost all authorities who have had to do with this subject, that massage ought to be practised on the naked body.

We come now to the physiological effects determined by massage. These pertain to the functions of the skin and muscles, to the circulation, nervous system, to absorption, and nutrition.

As for the cutaneous functions, energetic frictions rid the skin of the débris of epidermis by which it is encumbered. The orifices of the sudoriparous and sebaceous glands are cleared, and this facilitates the more regular and thorough performance of the circulatory functions, and respiration of the skin.

The action on the muscles is quite as marked, and by kneadings or strokings of the muscles we arouse and augment their contractility. Strike with the inner border of your hand the triceps cruralis, or the biceps,

and you will see produced on the parts of the muscle thus stroked a peculiar hard swelling, which results from its limited contraction. In certain pathological cases, where the adynamia is profound, as in typhoid fever, this cord-like swelling persists a long time. We have here a fact which well shows the local action of massage on muscular contractility.

Massage acts not only on the deep circulation, but also on the circulation of the muscles and skin. It is by kneadings and pressures that we influence the deep circulation, while it is by slappings and flagellations that we promote a greater activity of the cutaneous circulation, and all you have to do is to stroke a part with the open palm repeatedly to obtain over the parts thus smitten a redness of considerable intensity.

This enhanced activity imparted to the circulation entails an augmentation in its local and general temperature.

As for the local temperature, Mosengeil estimates the heat-rise by massage at 2° and even 3° C. Berné* places it at even a higher figure, and affirms that the rise in the local temperature may attain 5° C. The average, according to him, is 1½° C.

The action on the nervous system is twofold, and this point claims our attention for a moment, for massage has been very much vaunted in the treatment of neuralgias. Massage, and, in particular, deep pressures and kneadings, produce traction and stretching of the nerve-filaments. Hégart† has endeavored to demonstrate experimentally the elongation of nerves under the influence of the manœuvres of massage, and particularly of movements of flexion of the vertebral column.

Another action of massage on the nervous system is more difficult of explanation. I refer to the strange nervous effects produced by light rubbing (*effleurement*) of the skin, and which are described by some writers under the name of *magnetic passes*. You will find in the recent work of Baréty‡ a description of the effects of these passes, which he calls *neurization*. This quite special effect of certain practices of massage, although still badly understood, must, nevertheless, be taken into account in estimating the results which are obtained from these movements in the treatment of certain affections of the nervous system.

But probably the most important action of massage is that which it exercises on the absorption of certain effusions, whether hemorrhagic or inflammatory. Numerous experiments in physiology have been undertaken to explain this resolvent action.

For instance, Mosengeil, in injecting into the knee-joints of hares solutions of Chinese ink, has shown that when the joint is treated by massage, the Chinese ink which has been injected into the joints diffuses itself through the neighboring parts, and that this phenomenon is the more marked the longer the massage is continued. Moreover, Reibmayr and Höfinger have shown that when liquid is injected into the peritoneum of a hare, it is absorbed with greater rapidity if massage is practised. The following table, which I borrow from these experimenters, shows this quite peculiar local action of massage:

	Liquid absorbed per kilogramme of the subject.		
Duration.	Without massage.	With massage.	Difference in favor of massage.
During the first hour....	0.457	0.905	+ 0.452
During the second hour.	0.283	0.120	— 0.163
End of second hour.....	0.740	1.029	+ 0.289

In Sweden and in Germany, as you are aware, it is taught that the living cell is situated in a liquid atmosphere, to which is given the name of *parenchymatous juice*. It is by acting on this parenchymatous juice and on the lymph-spaces that, according to Loven, we are to explain the resolvent action of massage in inflammatory and periarticular affections.

Lastly, massage has an undoubted action on nutrition. It has, in fact, been demonstrated that the quantity of urea in the urine augments under the influence of general massage.

Gopadze has even affirmed that the assimilation of azotized substances is rendered more active by massage. In a series of experiments made on four medical students who were subjected to a special dietary regimen, the nitrogen being estimated both in the aliments and in the dejections, a general massage of twenty-five minutes, made once a day, three hours after the principal meal, caused a diminution in the amount of azotized matters contained in the fæces. From this the experimenter concluded that the assimilation of azotized matters was augmented.

This increased activity imparted to the di-

* Berné, "Researches on the Modifications of the Local Temperature under the Influence of Massage" (*Société Medico-Pratique*, 1885).

† Hégart, *Wiener Med. Blätter*, 1884.

‡ Baréty, "Animal Magnetism studied under the Name of Neuric Force," etc. Paris, 1887.

gestive and assimilative functions by massage has also been affirmed by a young Russian physician, Chpolinski, who, in his inaugural thesis, published last year, "*On the Length of Time that Aliments ordinarily Sojourn in the Stomach*," has shown that the massage of the stomachal region, practised for ten minutes at a time, will diminish the length of the sojourn of food in the stomach.

The first case on which he experimented was that of a medical student, in whom a meal consisting of five hundred grammes of meat was five hours and twenty-five minutes in completely disappearing from the stomach. The days when massage was performed the duration of gastric digestion was only four hours and thirty minutes.

In another subject, where a meal composed of two eggs and a gramme of salt required three hours and fifteen minutes for its disappearance from the stomach, massage reduced this period to two hours and forty-five minutes.

As you see, gentlemen, massage notably promotes the gastric digestion, or at least the passage of alimentary substances from the stomach into the intestine.

One of my pupils, Dr. Hirschberg, has taken up this question anew by some experiments which he has made in my laboratory, which have confirmed the data established by Chpolinski.

Taking for his basis a peculiar property which salol possesses of undergoing decomposition into salicylic acid only in an alkaline medium, Ewald had shown that we can utilize this reaction to ascertain the duration of the sojourn of aliments in the stomach. All you have to do is to test the urine for salicylic acid in individuals to whom salol has been given along with food; the more tardy the appearance of this acid, the longer will be the sojourn of the food in the stomach. In employing this reagent, Hirschberg shows that massage hastens this transformation, and that while in the ordinary state it takes two hours for salicylic acid to appear in the urine, forty minutes suffice after an abdominal massage.

These experiments have, moreover, brought to view a fact which physiologists who have taken up the subject of massage have touched lightly, and which at the same time seems to me to have capital importance in these applications of massotherapy: I refer to the augmentation of diuresis under the influence of abdominal massage. All our patients on whom abdominal massage has been practised have testified to a notable augmentation in the urine, which sometimes amounts to double the normal quantity, and this is an important point, to which I propose to return when we come to study the indications for massotherapy.

Now that you know the manœuvres of massage (which, in fact, are not at all difficult), and the physiological effects which may be expected therefrom, we may profitably take up the study of the therapeutic applications of massage.

II.

APPLICATIONS OF MASSOTHERAPY.

The applications of massage to therapeutics are numerous. We will, if you please, consider them under several heads, and will successively speak of massage in its applications to obstetrics, gynæcology, surgery, and medicine.

1. The use of massage in obstetrics dates back from the most ancient times. Among all primitive peoples we find massage employed in the practice of midwifery. If you will refer to works written on the obstetrics of different nations (as for instance the familiar treatise of Corre), you will see that almost all the odd methods put in usage are only various forms of massage.

By massage four results are obtained,—(*a*) the contractions of the uterus are excited; (*b*) vicious positions are rectified; (*c*) the placenta is delivered by the process called *expression* (Credé's method); (*d*) hemorrhages are arrested. To-day all these manœuvres are well known, and give, as you know, excellent results.

Massage of the gravid uterus is made by circular passes over the abdomen. Under some circumstances bimanual massage is of great utility,—*i.e.*, one hand is introduced into the uterine cavity, while the other endeavors by abdominal frictions to excite uterine contractions. This latter manœuvre is principally put in usage in cases of postpartum hemorrhages.

2. In gynæcology it is Norström who has shown himself the most ardent inculcator of massage, which one of his fellow-countrymen, Thure Brandt, a man who, by the way, had no knowledge of medicine, was the first to suggest for the cure of uterine affections. The practice of the Swedish empiric dates from 1868. Thure Brandt recommends three processes of massage, one of which he calls *external massage*, and which consists in rubbing and kneading the abdominal parietes, through which the operator seeks to plunge

his fingers deeply, and, if possible, into the pelvic cavity.

The other process is called *mixed massage*. The patient is placed on her back, and the masseur, taking his position at her left, compresses the uterus with the right hand upon the index and middle finger of the left hand introduced into the vagina; in certain cases, even, the fingers are introduced into the rectum. But the process to which Thure Brandt gives the preference is that which he calls *combined massage*, and which I shall the rather call *massage with four hands;* and this is the way that this strange method is put in practice, demanding, as it does, two operators:

One of the masseurs, taking his position between the legs of the patient, introduces the fingers of the left hand into the vagina and raises the uterus, while, with the right hand placed under the hips, he kneads the sacro-lumbalis muscles. The other masseur operates on the abdominal parietes, and associating and giving a rhythmical character to their manœuvres, the two practitioners devote themselves to rubbings, tractions, and kneadings of all sorts.

One cannot too strongly condemn such practices, and my pupil, Dr. Leon Petit, in his communication on "Massage of the Uterus," made to the Society of Practical Medicine,* has well shown how useless and how dangerous are such manœuvres, which belong rather to the domain of onanism than to that of therapeutics. So, notwithstanding the facts cited by the advocates of uterine massage, and in particular by Reeves Jackson, of New York, and Norström, of Paris, I pray you never to employ such methods.

Besides all the moral drawbacks which result from this handling and rubbing of the genital parts, and of which I need say no more, there is a rule which is imperative in almost all uterine affections, viz., rest of the organ is indispensable. My master, Bernutz, has justly insisted on this fact, that in most uterine maladies it is rest of the organ and function which brings about the cure, and it is a violation of this rule to introduce the hand into the vagina, and thereby exercise pressures or frictions, which, however light they may be, tend to excite and congest the genitals. Therefore, notwithstanding the sixteen favorable observations recently published by Paul Profanter,† where massage applied to the treatment of displacements and of prolapsus, as well as of uterine and periuterine engorgements, has resulted in cure, I persist in believing that this method has more of evil than of advantage in the treatment of these affections, and I pass now to the application of massage to surgery.

3. I shall be brief on these surgical applications, and shall concern myself particularly with the treatment of sprains by massage. I ought to remind you, however, that massage, heretofore reserved in surgery for the joint-diseases, has been applied the last few years to the treatment of fractures, and this has been done under the influence of Schode of Hamburg, of Menzel of Trieste, of Mezger and Tilanus of Amsterdam, and especially of Lucas-Championnière, who, in July, 1866, communicated to the Society of Surgery the successful results which had been obtained in fractures by massage. Berne, who was one of the first in France to recommend massage in the treatment of fractures, and whose writings are even anterior to those of Lucas-Championnière, considers fractures of the radius and of the fibula at their lower extremities, also those of the elbow and patella, as especially tributary to this method. He regards the application of a splint which can be easily removed at the moment of massage, as more useful than any permanent fixture, because presenting no impediment to the prompt return of the functions of the joint.‡

Quite recently, moreover, Prof. Masse of Bordeaux § has taken up the subject again, and pointed out all the benefits derivable from massotherapy in counteracting the disastrous effects of immobilization as imposed by the retentive apparatuses hitherto applied in these cases.

The treatment of SPRAINS by massage has been attended with excellent results. First practised by the bone-setters, gray nuns, "sprain-blowers" (*souffleurs d'entorses*), etc., massage is to-day employed in the treatment of sprain by all surgeons, and the works of Ellaume, of Lebatard, of Mervy, of Estradère, of Rizet, etc., show us the importance of this method.

* Leon Petit, "On Massage of the Uterus in Obstetrics and Gynæcology" (*Journal de Médecine de Paris*, May 16, 1886).

† Paul Profanter, "On Massage in Gynæcology" (*Wien.*, 1887).

‡ Berne, "On the Technics of the Treatment of Fractures by Massage" (*Revue Gen. de Clin. et de Thèr.*, June, 1887).

§ Masse, "On the Treatment of Fractures by Massage" (*Gaz. Hebd. des Soc. Méd. de Bordeaux*, July 3, 1887).

All cases of sprain, simple or complicated, except, of course, those where there exists a fracture of the joints (and we have seen that even this is not now regarded as a contra-indication), are tributary to massage. The beneficial effects are the more speedy and the more certain the sooner massage is applied after the accident, and you will often see patients who at first could not stand on their feet get up and walk, and even return to their homes on foot, after their first séance of massage.

But it is necessary to be exact in the diagnosis, and this it is that explains the reason of the successes and the failures of the bone-setters, who apply massage to all the traumatisms of the joints, whether these pertain to sprain or to white swelling. In the case of sprain, marvellous results are easily obtained, while in white swelling only disastrous consequences would ensue from massage.

You ought, then, gentlemen, to understand well all the manœuvres of massage in sprains. All that have been counselled thus far may be summed up in three processes,—those of Lebatard, of Gerard, and of Magne.

In the process of Lebatard, the masseur seizes the heel of the extremity which is the seat of the sprain with the palm of the opposite hand ; then he makes with the foot a see-saw motion back and forth, while exercising a strong traction on the tendo-Achillis. In this manipulation the thumb is made to grasp as far as possible the tibio-tarsal swelling, while the endeavor is made to force behind the external malleolus all the swollen parts. The opposite hand executes similar movements over the internal malleolus ; then, when the malleoli have recovered their natural form, the fingers seek by pressures over the tendo-Achillis to free that tendon.

Gerard's method is less harsh than that of Lebatard. It consists in light rubbings (*effleurements*) with the tips of the fingers. After ten or fifteen minutes the operator passes to the second stage, which comprehends a kneading of the peri-malleolar parts ; this is made from below upward, from the tips of the toes to the upper third of the tibia. Then the massage is completed by a few flexions and extensions of the joint.

Magne's process, adopted by Estradère, is intermediary between the other two. The operator commences by frictions, the intensity of which is gradually augmented. At the end of thirty or forty minutes, he exercises the joint after the manner of Lebatard, then he finishes by a massage of fifteen or twenty minutes. The total duration of the operation is nearly two hours.

As you see, gentlemen, the massage of sprains is very simple, demanding of the physician first an accurate diagnosis, then energy, then patience.

Busch, who in Ziemssen's Hand-book has given a good monograph on massage, considers that in sprains these manipulations fulfil the three following ends: First, they restore the parts to their natural situation, and in this connection he refers to the practice of one of our surgeons, Ravaton, who, in cases of sprain, has two stout men pull apart the articular surfaces, while the hands of the surgeon are clasped tightly around the joint thus stretched. The second effect of massage is to lessen and abate the muscular spasm which always accompanies the articular distortion. Here kneadings of the muscles act the most effectually in antagonizing this spasmodic state. The third result obtained by massage consists in the disappearance of the blood-effusion which attends sprains ; the absorption and removal of this effusion is promoted by the rubbings, which are made from the extremity of the member to its base.

As for the results thus far gained, statistics are most favorable, and in those which have been published by Mullier and Moller, it appears that while immobilization and ice will bring about the cure of a sprain in an average of twenty-five days, massage well performed will accomplish this result in an average of nine days.

In the Prussian army, where massage is obligatory in a certain number of affections, and, in particular, in sprains, the military surgeons, in their half-yearly reports, do not fail to communicate the results obtained by this method. By referring to the reports of Starke, Gassner, Brurberger, Gerst, and Korner, you will see that the average duration of the disability entailed by sprains, where massage has not been employed, is 27.3 days, and where massage has been used 8.9 days, so that you see there is a difference of 14.8 days in favor of the treatment of sprains by massage. It is to be wished that the same practice might be obligatory on the military surgeons of our army. I ought here to remark, however, that my friend and colleague, Marc Sée, considers compression made with an elastic bandage, in the case of sprains, superior in its results to massage.*

* Marc Sée, "On Sprain and its Treatment." Paris, 1884.

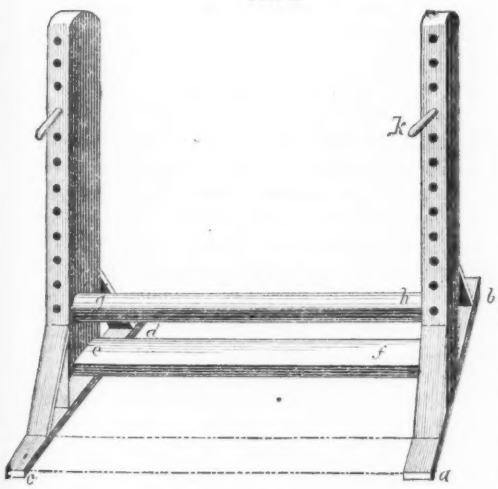
4. I come now to the medical applications of massage. These are very numerous, and we will, if you please, divide them into several groups. I will speak, first, of massage in the treatment of pain, then in articular and muscular affections, then in neuroses, and, lastly, in certain visceral affections.

As I have before told you, it is by an instinctive movement that man seeks to relieve pain by frictions, and I have often seen patients in the agonies of tic douleureux rub the skin till abrasion and bleeding were produced. Experts have given regularity and system to these practices, and what I have to say on this head shall pertain particularly to sciatica and migraine.

It is Schreiber* who has given us the most precise rules as to the treatment of sciatica by massage. The treatment of sciatica, according to Schreiber, consists in massage, the application of certain apparatuses, and in passive movements.

The apparatus consists of a frame, of a mechanical bed, and of several short joists.

FIG. 1.



The frame is a very simple affair, and is composed of two uprights pierced with holes, which enable one to elevate to variable heights a horizontal bar (*g*, *h*). (See Fig. 1.) As for the mechanical bed (Fig. 2), it is also of Schreiber's invention, and is of simple construction. It is composed, as you see, of different segments, which are raised or lowered at will by means of ratchets. The patient is placed on the bed, as is shown in Fig. 3. As for the joists, they are one metre long, six centimetres thick, and twelve centimetres wide.

This is the way these means are utilized, along with massage, in the treatment of sciatica. I shall not follow Schreiber in the enumeration of all the manœuvres, day by day up to the thirty-second day, which are prescribed by that authority, but shall only give a rapid sketch of his method.

The first day the patient is placed before the frame, and the horizontal wooden bar being placed as low as possible in the two uprights, by adjusting the pins (*k*), the patient is directed to extend the foot of the affected limb upon the transverse bar, holding on to the two uprights by his hands. This manœuvre is repeated ten times.

Then the patient is placed on the mechanical bed, as is seen in Fig. 3, and passive movements are executed, which consist in flexing the thighs on the body and elevating the leg on the thigh; these movements are repeated twenty times. Lastly, a gentle massage is practised, which consists the first day in simple light rubbings over the painful points.

The second day these manœuvres are repeated, especial attention being given to massage, and kneading of the muscles is then begun. Passive movements also are performed; the thigh is moved back and forth from the middle line.

Then the following days the movements are progressively increased, and the horizontal bar of the frame is gradually raised by putting it into the higher sockets, so that the patient is obliged every day to attain with the foot a greater height.

At the end of the first week the exercises with the little posts are commenced. These are placed on the ground at regular intervals (like nine-pins), and the patient is made to walk between them without hitting them with his feet.

Lastly, the passive movements are performed by rotating the affected thigh in its joint.

Such is the mechanotherapy and the massotherapy treatment of Schreiber. It is, as you see, somewhat complicated and lengthy, and is only applicable to cases of sciatica which are stubborn,—*i.e.*, to those which have resisted punctiform cauterizations and the methyl spray. In such cases as these I cannot too much recommend Schreiber's method.

This practice of massage is applicable to all the other neuralgias, but the manœuvres are variable, according to the seat of pain, and among these painful affections I must

* See his book on "Massage," recently published by Lea, Philadelphia.

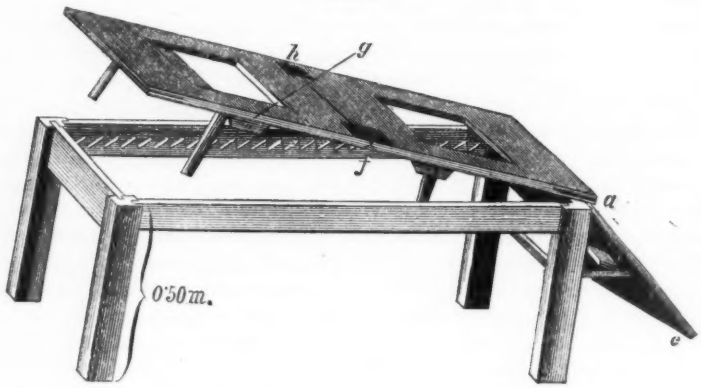
point out to you in particular the good effects of massage in the treatment of migraine. Here it is principally the muscles of the head which are treated by massage, which is performed with the pulps of the fingers; this is the *pulpation* of Laisné, which consists of a series of taps made over different points of the head, just as if one was playing on a piano. A certain dexterity is required in executing this manœuvre, which, if we may trust the trials made by Romberg, by Dubois-Reymond, and especially by Dr. Weiss, gives excellent results.

Lucas Pardington has, moreover, quite recently taken up the subject of treatment of migraine by massage, and he has reported a case of a man, 26 years of age, suffering from hemicrania of grave form and rebellious to all the means of treatment, which was cured in three days by séances of massage of twenty minutes' duration made over all points of the head and neck which were affected.*

As for the articular affections, it may be affirmed that all kinds of stiff joints, chronic arthritis, periarticular engorgements, chronic synovitis, chronic rheumatism under all its forms, are tributary to treatment by massage.

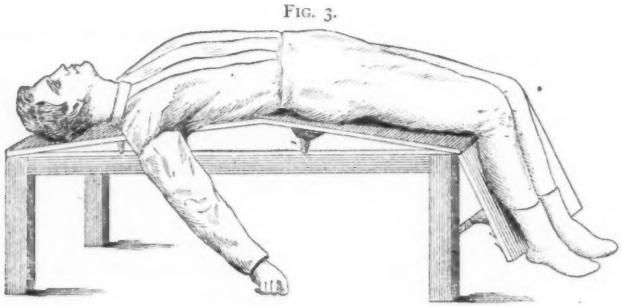
It is well understood that massotherapy must not be employed till at an advanced period of the disease, when all the acute inflammatory symptoms have subsided. Danger-

FIG. 2.



ous as it is to practise massage on a joint which is the seat of an intense acute inflammation, there is no disputing the advantage which such massage can confer on joints when the acute symptoms have disappeared, and you can see at any time in our hospital wards the remarkable results obtained from massage by our clinical assistant, M'lle. Chappat, in the treatment of the sequelæ of rheumatism, generally so long and painful. Here the action of massage is twofold. It not only restores movement to the joint, but it promotes resolution and disappearance of engorgements and periarticular adhesions.

FIG. 3.



The manipulations vary according to the joints affected, but all have this end,—gradually to restore the movements of the joint on the one hand, and the natural form of the joint on the other.

It is the same with the muscular affections,

* Pardington, "On the Treatment of Migraine by Massage" (*The Practitioner*, 1887).

—atrophy and contracture. In these cases massage is superior to gymnastics.

In his interesting monograph on massage, William Murrell calls particular attention to the benefits which may be derived from massage in infantile paralysis, locomotor ataxia, and in writer's cramp.

Wolf, of Frankfort-on-the-Main, was the first to lay down the rules of treatment of writer's cramp by massage. Wolf is not a physician, but a professor of gymnastics. The method which he urges consists of massage and gymnastic manœuvres. His favorite massage movements are principally frictions and digital taps. The gymnastics which he advises are both active and passive, the former consisting in sudden movements, which the patients execute with the hands, which are now opened and now shut, and which are kept up for half an hour; these exercises are repeated three times a day. The passive movements consist in the forced distention, or rather elongation, of the muscles of the fore-arm. This elongation is done by the patient himself, who repeats it three or four hundred times a day. If we may believe Romain Vigouroux,* this treatment causes writer's cramp to disappear in a fortnight.

I will add that for the symptom cramp, whatever may be its cause, massage is a sovereign remedy, and you should here employ principally kneading of the muscles and the strokes or taps (*tapotement*).

Paralysis agitans is also believed to be amenable to treatment by massage, and Berbès has recently reported to the Society of Therapeutics the favorable results which he has obtained by this means in a case of Parkinson's disease.†

As for the neuroses, I shall not repeat what I have said *à propos* of the treatment of chorea by gymnastics, where, in truth, massage is oftener employed than gymnastics properly so called, but I must call your especial attention to massage in hysteria, because serving as the basis of a kind of treatment of this disease which has become very popular of late years under the name of S. Weir Mitchell's method. This mode of treatment is complex, and demands for its execution the isolation of the patient, absolute repose, and the employment of massage and electricity.

Dr. S. Weir Mitchell begins by completely isolating his hysterical patients from their family and usual surroundings, and putting them under the care of a trained nurse, who never leaves them; then he subjects them to absolute repose and a special diet system, of which milk and eggs form the basis. Then he insists on the application of general massage, and sometimes of electricity, which plays, however, but a secondary rôle in the treatment, as the movements produced thereby only serve to combat the disastrous effects of immobility. This treatment has had but few advocates in France, and it is hardly applicable except to extreme cases of hysteria. Nothing shows that it is superior to the treatment which we employ in such cases,—isolation, hydrotherapy, and exercise in the open air. I shall, however, return to all these points in one of my future lectures on hydrotherapy.

It remains for me to say a few words concerning massage in general affections. In diseases of the heart, massage will render you service in combating œdema, and the same may be said of œdema due to renal affections; and I remember to have seen a remarkable example of this. The patient was the wife of a medical *confrère*, who was suffering from albuminous nephritis, with considerable anasarca of the lower limbs, which doomed her to absolute rest. Massage removed the œdema, which did not return, although the quantity of albumen in the urine remained unchanged.

Here the effects of massage are twofold. It acts, first of all, locally, and favors the resorption of effused liquids; then it has a general action, promoting nutrition, augmenting the excretion of urea, and thus combating one of the effects of chronic alterations of the kidneys.

Furthermore, I showed you, while speaking of the physiological action of massage, that the practice of abdominal massage notably augments the excretion of urine. This is an effect which ought to be taken account of in explaining the favorable effects of massage in cardiac and renal affections.

Lastly, in abdominal affections, constipation, and dilatation of the stomach, massage has been found to give excellent results. When, in fact, you study the physiological observations of Chpolianski and of Gopadze, you see that by massage the assimilative functions of the digestive tube are promoted, and the passage of the alimentary bolus is favored. Clinical observations give support to the facts testified to by physiology.

As for constipation, everybody is agreed in

* Romain Vigouroux, "On the Treatment of Writer's Cramp by Wolf's Method" (*Progrès Médical*, January 21, 1882).

† Berbès, Soc. de Thér., Session June 8, 1887.

acknowledging the good results obtained by massage. Berne,* who has so urged the importance of abdominal massage, recommends the following mode of procedure: After having kneaded the abdominal teguments, then the abdominal muscles, the operator makes gentle pressure over the cæcal region with the palmar extremities of the last four fingers; then, with the closed fists, he performs massage over the whole extent of the colon. Berne insists that this massage shall be both very gentle and very deep. He recommends, moreover, that the patient should be made to urinate before massage, and that careful examination should be made to see if there be any tumors in the abdomen, or any calculus in the gall-bladder. The length of each séance should be fifteen or twenty minutes. Besides insisting on the mechanical action of massage, Berne makes great account of the property which these exercises possess in promoting the secretion of bile. Hence he advises to associate with the abovementioned manœuvres gentle pressures over the gall-bladder.

As for the application of massage to the affections of the stomach, and in particular to dilatation of the stomach, massage in these cases gives excellent results. For more than a month past you have seen in our hospital wards Dr. Hirschberg practise massage on the greater part of our patients who are suffering from dilatation of the stomach. You have been enabled to witness the marked benefits which these patients have derived therefrom; their digestion is improved, their weight is augmented, the *clapotement* and all the distressing symptoms are alleviated. It is, then, a practice which you ought to resort to in such cases.

Such are, rapidly summarized, the hints that I wish to give you respecting massage. I believe that these suggestions will be of value to you, and that you will be able to turn them to account in your future practice. For my part I have never ceased to felicitate myself on the use which I have made of massage.

In the next lecture we will undertake the study of one of the most powerful agents of hygienic therapeutics, often put in practice along with gymnastics and massotherapy: I refer to hydrotherapy.

* Berne, "Treatment of Constipation by Massage." Paris, 1887.

DITANA DIGITIFOLIA.

By H. H. Rusby, M.D., Detroit, Mich.

WE are told that in 1870 Prof. Westore Giurleo received from a friend, an Italian chemist, then residing in Mexico, the flowers of a plant whose habitat was said to be Virginia. On account of the peculiar construction of the leaf the plant was called *Ditana digitifolia*. Experiment with the drug, with reference to its therapeutic value, disclosed the fact that it possessed valuable galactagogue properties, as by its internal "application" the secretion of the milk could be perceptibly increased. Thorough investigation could not be made on account of the scarcity of material at hand. Prof. Giurleo, however, read a paper on the subject of this plant and its properties, under the name of *Ditana digitifolia*, before the Italian Medical Congress of Perugia, by which means he succeeded in getting the drug before the reputable physicians of Europe, and secured notices in the medical press, the name *Ditana digitifolia* always being used. An abstract of his paper was printed in *Il Morgagni*, parte II, 44, 1885. This article afterwards reappeared in the *Deutsche Medizinal Zeitung*, and was from time to time noticed in many other journals. In this country it was briefly referred to in the Therapeutic Gazette, *The Chicago Med. News*, and the *N. Y. Med. Journal*. The *Med. News* says, "The professor has apparently been misled, as no one but himself has been able to find the plant." The *Med. Journal* considers that *Ditana digitifolia* is a synonyme for *Rhamnus alaternus* L.

Mr. Thomas Christy desiring to obtain supplies of the drug, wrote to his agent in Mexico, enclosing a drawing of the plant, copied from an advertisement of a patent medicine claiming to be made therefrom. His agent replied that he had been unable to obtain any information in regard to it, but that, judging from the drawing, it belonged in the family Onagraceæ, the flowers having the form of *Zauschneria*. Mr. Christy then applied directly to Giurleo, but his communication was unnoticed. Messrs. Parke, Davis & Co., taking the investigation in hand, after vainly exhausting every other source of possible information, wrote to Prof. Giurleo, urging that he should satisfy the growing inquiry regarding this name. In reply they received a supply of quack advertisements, with a label printed in four languages, in which Giurleo sets forth that the remarkable remedy "Ga-

lattoforo," "invented by him," is already recommended by all the leading therapeutists, and "all people," he says, "ask it above all for its perfection, good taste, and prodigious virtue." He then furnishes popular directions for its use, appeals to the public to purchase directly from himself, "the inventor," and concludes by stating that orders unaccompanied by cash are worthless, an announcement which appears to be quite necessary in the Mediterranean countries. Accompanying is a little pamphlet for public distribution filled with popular testimonials. As a frontispiece we have a picture of a fond mother viewing her children playing in the shade of the wonderful plant, whose single terminal flower appears to be more than eighteen inches in length,—looks like a gigantic fuchsia. On page 4 is a second cut of the plant, which differs considerably from that in the frontispiece, having apparently been constructed to indicate how much more like a kid glove the "inventor" could have made the leaves than nature has done.

Such is the information that we have been able to secure concerning *Ditana digitifolia* and its proprietary product Galattoforo. From it we deduce the following conclusions:

1. *Ditana digitifolia* means nothing. It is not a botanical name, as it has never been accompanied by any description, and the originator has even been ashamed to append his name as authority. It will never be admitted into any botanical work. The *Medical Journal* is in error in supposing it to be a synonyme for *Rhamnus alaternus* L., as the little that has been published rather contrasts the two plants as being antagonistic in their action.

2. The plant represented by Prof. Giurleo under this name is a botanical impossibility. Its leaves exclude it from the family Onagraceæ; but, aside from this, the whole figure is a monstrosity, and that on page 4 of the pamphlet carries on its face the evidence of fraud, in the manner in which it has been doctored, to produce a sensational effect.

3. Further evidences of fraud are found in the attempt to mislead the public into the belief that the plant is unknown, or has no other name than the fanciful one above referred to. The eighteen years during which the professor has been receiving supplies for the manufacture of his quack medicine has afforded ample opportunities for securing material for botanical identification if it were a known plant. If, on the contrary, it were unknown, it should have been referred to some competent botanist for classification and publication. Under the circumstances, we are perfectly justified in assuming that the whole thing is scientifically a swindle from beginning to end, and that the origin of Galattoforo may as well be a door-yard weed from the vicinity of Rome as some mysterious plant from Mexico.

Lastly, and what is of the greatest importance for us to consider, there is no doubt that numbers of sincere people, especially in Europe, have been deceived and misled by this man, who appears to have enjoyed heretofore some degree of reputation. Their error has been that of accepting a name unaccompanied by its authority. It is a cardinal rule among botanists to append the name of the author of a species in every case where the name is written, unless it may occur several times in the course of a single article. This rule has not been generally recognized by the medical press, particularly in the United States. In just so far as they have failed to do so they have been unscientific, and in a most important particular, for it is certain that in a large majority of cases such errors and deceptions creep in through a failure to observe this judicious regulation. If Prof. Giurleo does not wish to be ranked among charlatans he must tell us the truth about *Ditana digitifolia*.

OXYGEN ENEMATA.

By J. H. Kellogg, M.D., Battle Creek, Mich.

SOME weeks ago, while employing the carbon-dioxide and sulphuretted hydrogen enemata, it occurred to me that oxygen gas might be employed advantageously in the same manner. Having at that time under treatment a case of lithiasis, I resolved to make a trial of the administration of oxygen by enema, in the hope that by the introduction of oxygen directly into the portal circulation the conversion of uric acid into urea might be aided, and my patient thereby relieved. I was at first deterred from the attempt by the supposition that oxygen would probably give pain, as it has been claimed that the pain sometimes occasioned in the employment of sulphuretted hydrogen by the Bergeon method is produced by the accidental injection of small quantities of atmospheric air. I determined, however, to try the experiment, and made the first injec-

tion of two litres of pure oxygen gas on June 20. At this time the patient, a man of 28 years, was passing very great quantities of uric acid daily, a large quantity of crystals being thrown down from every specimen of urine passed. The symptom had persisted most stubbornly for weeks in spite of the enforcement of a non-nitrogenous diet, the patient also taking by direction from three to five pints of hot water daily. The beneficial effect of either regimen or treatment was so slight as to be scarcely perceptible. Two litres of oxygen were administered regularly each day about 10 A.M. At the end of three days the excess of uric acid disappeared entirely from the urine, and has appeared only twice since, and then in small quantity, when the injection had been discontinued for a day or two. At the beginning of treatment the patient's skin was very muddy, sclerotics dingy, tongue coated, and he complained of a constant and very annoying brassy taste in the mouth and distressing headache. The brassy taste and headache both disappeared very soon after the injections were begun, and there has been a steady improvement in every other particular. The coat has disappeared from the tongue, the skin and sclerotics have become nearly normal in appearance, and the patient has gained several pounds in weight, though before he had been constantly losing weight for some weeks, and seems to be in every respect improved. The patient, a very intelligent gentleman, attributes his improvement almost wholly to the employment of the oxygen, as the measures which had been previously employed had had little or no favorable influence upon his condition, and no change in regimen or treatment has been made with the exception of the administration of the oxygen. It seems to the writer that there may be a large field of usefulness for oxygen employed after this method. The advantages of the employment of oxygen by enema, as compared with the inhalation of oxygen, are very great.

1. In the inhalation of oxygen only a very small portion of the gas inhaled can be used, the greater part being wasted, as experiment has shown that not more than one-fourth of the oxygen contained in the air is extracted by the lungs during the passage of the air through them in ordinary respiration, and that a very much smaller proportion is absorbed when the quantity of air passing through the lungs is increased, as in deep breathing. Hence, in order to get into the system any considerable quantity of oxygen, it is necessary for a person to inhale a very large amount, making the treatment very expensive.

2. Experiments which have been made for the purpose of testing the therapeutic value of oxygen inhalations have shown that the proportion of oxygen absorbed by the lungs is not proportionally increased by the increase of the percentage of oxygen in the respired air. Indeed, the reported results of careful experiments show that very little more oxygen was actually received by the system when breathing pure oxygen than in the breathing of ordinary atmospheric air. When oxygen is introduced into the alimentary canal the entire quantity introduced is absorbed, and thus utilized, making it possible to introduce a known quantity of oxygen into the system, and in a manner which leaves no room for doubt that it has been received and appropriated.

3. In cases in which it may be considered desirable that a considerable quantity of oxygen should be introduced into the system for the purpose of encouraging the oxidation processes by which effete matters are disintegrated and prepared for alimentation, especially those which are acted upon by the liver, the oxygen enema offers a means by which the gas can be applied where it is most needed. Oxygen received by the lungs passes at once to the left side of the heart, and thence through the arterial system to the entire body, so that the liver receives no more than its due proportion of the gas. Consequently, a very considerable increase in the quantity of oxygen absorbed through the lungs would scarcely increase to an appreciable degree the amount of oxygen available for use by the liver. This fact is made particularly conspicuous when we reflect that the chief source of blood-supply to the liver is the portal circulation. It is apparent, however, that when oxygen is introduced into the lower part of the alimentary canal, it is at once received through the venous absorbents into the portal circulation, through which it is conveyed directly to the liver, precisely where it is needed, thus making the entire amount of oxygen administered available for the purpose for which it is administered. Is it not, then, apparent that this method of administering oxygen possesses, for cases of the sort referred to, an immense advantage over its use by inhalation?

4. The process of digestion is, from a chemical stand-point, chiefly a process of hydration and oxidation. The experiments

of Dujardin-Beaumetz, performed some time ago, showed that the drinking of oxygenated water exerts a very beneficial effect upon the digestive process in persons suffering with slow digestion. (I have not seen any extended account of experiments of Dujardin-Beaumetz; I have simply seen in medical literature a mention of the fact stated.) May it not be true that, in some cases at least, the difficulty under which the digestive organs labor is a lack of a sufficient supply of oxygen in the blood, or, at any rate, that the introduction of oxygen into the portal circulation by oxygen enemata may be found to facilitate the digestive process? It is very easy to make a practical test of the matter, and I am now engaged in a series of experiments in the use of oxygen in various forms of dyspepsia, the results of which I shall report at some future time.

5. It seems to me that oxygen enemata may be employed advantageously in a great variety of cases; in fact, in all cases in which there is such a disturbance of the normal interchange of gases in the lungs as deprives the system of its proper amount of oxygen. The mucous membrane of the intestines presents an absorbing surface; very small, it is true, when compared with the amount of surface presented to the air in the lungs, and yet it is sufficiently great to allow of the introduction into the system of a large amount of oxygen in addition to that which can be gotten in through the lungs; and this additional quantity, though small when compared with the total amount received by the lungs, may be of sufficient value to the system to be of immense advantage to it, especially on account of its introduction at this particular point in the circulation. The notable functional disturbances of the stomach which accompany various pulmonary disorders, such as emphysema, chronic bronchial catarrh, chronic pleurisy, pneumothorax, etc., suggest a very important relation between the digestive function and the quantity of oxygen received through the lungs. The same relation is also suggested by the frequency with which dyspepsia occurs among sedentary persons, who are habitually air-starved in consequence of deficient muscular activity. Oxygen enemata may prove a valuable remedy in cases of this sort, as well as in others in which an additional supply of oxygen is needed.

I have carefully questioned patients respecting the retention of the oxygen injected, and have found that it has always been retained without difficulty, and does not pass off as flatus from the bowels or eructations from the stomach. This fact offers good evidence of its absorption, but to determine the fact beyond the possibility of question, I made on July 20 an experiment on a guinea-pig. After placing the animal under chloroform, the abdomen was opened, and the intestines drawn out and spread out in such a way that the dark portal veins were in full view. A quantity of gas was then injected into the rectum, and to my great satisfaction I found that the dark venous blood assumed a bright red hue almost equal to that of arterial blood within less than one minute after the injection of the gas, showing the rapidity with which the absorption of the oxygen takes place. To confirm the result, I allowed the oxygen to escape from the bowels, afterwards replacing it, and repeating the experiment several times. In each instance the color of the blood in the mesenteric veins assumed its ordinary dark purple color immediately after the oxygen was withdrawn, while the bright color returned almost instantly when the new supply of oxygen was introduced. I have been informed by Dr. Hal Wyman, of Detroit, that he made a similar experiment upon dogs a number of years ago, and that he observed the same result as regards the effect of the oxygen on the color of the blood in the portal circulation, but I understand that he made no attempt to employ oxygen in this manner for therapeutic purposes. Indeed, I am not aware that the gas has been used in this manner prior to my own experiment in the case which I have reported. I shall, however, be much surprised if I learn that I am entitled to the credit of priority in this matter, as it seems to me that I must have been very dull not to have sooner thought of this mode of employing so valuable an agent as oxygen.

It has been long known to physiologists that in certain fishes the mucous lining of the alimentary canal performs a very important part of the work of the respiratory system. Some members of the gar family are killed as quickly by cutting off the supply of oxygen to the alimentary canal as by interrupting the gill respiration. Great numbers of illustrations might be given from the lower classes of the animal kingdom in which the entire process of respiration is carried on by the mucous lining of the alimentary canal. Why, then, should not man, whose alimentary canal is very much more extensive and better fitted for absorption than in lower animals, also be able to receive a very appreciable and effi-

cient amount of oxygen through this channel? In my experiments thus far I have found that patients take without inconvenience from one to two litres of the gas at a time, and this dose can be repeated three or four times in the twenty-four hours without any difficulty. I have never found any serious discomfort to be produced, although in large quantities it does not seem to be tolerated quite so readily as the carbon-dioxide and sulphuretted hydrogen mixture.

I am employing the oxygen enemata in a variety of cases, in one of which, a case of phthisis, the beneficial results arising from the gas have been surprising. When the treatment was begun the patient had for some time had an evening temperature varying from two to three degrees above normal. The morning temperature was from 99° to 99⅘°. Within forty-eight hours after the use of the oxygen was begun the temperature fell to normal, and did not rise above 99° at any time until about two weeks after the beginning of treatment, when the febrile symptoms reappeared as a result of an operation for the relief of a troublesome hemorrhoid, following which the patient by imprudence contracted a slight cold.

In the use of the oxygen enema I have employed a new form of apparatus, which I devised some time ago, and which I described in a paper read before the late meeting of the Medical Association in Chicago. The especial advantages of this apparatus are convenience in use, precision in dose, and an easily-regulated and perfectly uniform flow.

THE FOUR CEREBRAL HEAT-CENTRES.

By Isaac Ott, M.D., and William S. Carter.*

THE discovery that fever† is mainly a disease of the nervous system, that albumoses, peptones, the leucomaine neurine,‡ produce fever through it, that the modern antipyretics reduce fever by an action on it, all of which can be shown by the curarization of animals, have stimulated us to study more minutely the heat-centres first discovered by one of us to be about the corpus striatum. The ascribing of fever, sleep, and the action of peripheral irritants to the modifications of the circulation is an entirely erroneous view of the true state of affairs in these cases; the circulatory changes are merely associated phenomena.

Method.—Our experiments were performed upon rabbits, and punctures of the brain made through trephined openings in the skull and through the orbit. After the operation the wounds were cleansed with a sublimate solution, the parts united by sutures, and the animal permitted to run about the laboratory. The trephine used was usually one about three millimetres in diameter, occasionally a larger one of Pasteur's. The instrument with which we punctured was about three millimetres in width at its point and a millimetre in the shank. To hit the anterior ends of the thalami, or parts in front of them, we felt for a prominence just back of the orbit, and drew an imaginary line through its middle, making the puncture about a millimetre from the median line. After the observations were completed the animal was killed, and sections of the brain made to determine the seat of the puncture. The thermometers used were corrected at the Yale Observatory, and the bent rectal thermometer was always used in the same manner. The calorimetric observations were made with D'Arsonval's calorimeter, which was surrounded with feathers, felt, and saw-dust. The error is .025° F. for each degree the air is above the temperature of the calorimeter. We used the instrument so that it was about a degree below the temperature of the surrounding air. One of us has already determined that the cortex overlying the basal ganglia has when injured but little effect upon the temperature. Lesions of the cortex beneath the thalami cause a slight fugitive increase.

One § of us, in July, 1885, determined that the thalamus increases the temperature by augmenting heat production.

Drs. Sachs‖ and Aronsohn, in October, 1885, have shown that wounds of the tissues about the corpora striata and the nodus cursorius increase the urinary nitrogen, the amount of oxygen absorbed and carbonic acid exhaled, and the pulse and respiration. These facts do not prove that the increased temperature is due to increased production, for D'Arsonval¶ has shown that chemical processes do not give the exact measure of the production of heat, since the incubating egg

* Student of Medicine.

† Ott and Collmar, *Philadelphia Medical News*, 1887, and *Journal of Physiology*, August, 1887.

‡ Ott, *Journal of Nervous and Mental Diseases*, April, 1884.

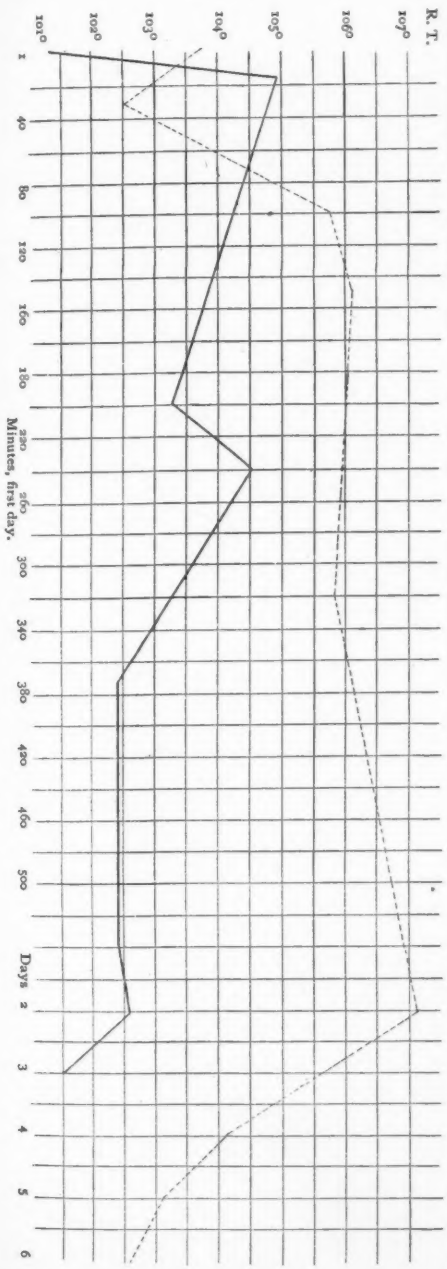
§ *Philadelphia Medical News*, July, 1885.

‖ *Pflüger's Archiv*, 1885.

¶ *Compt. Rendus*, 1881.

in its first stage absorbs considerable heat and also oxygen, whilst it exhales carbonic acid. It is necessary to study in addition arterial tension, and also make at the same time

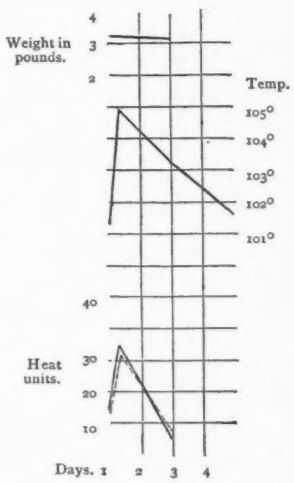
FIG. 1.



calorimetric observations, to be absolutely sure that the thermometric increase is due to augmented production of heat. This we propose to do in this paper, so that at the same time we can give the height of the thermometer, the amount of heat production and heat dissipation, and the decrease of weight for each day of the fever.

1. *The Heat-Centre about the Corpus Striatum.*—It has already been noted by one of us,* when a transverse section of both corpora striata were made, that the temperature rose rapidly to 111½° F. Lesions in front of and beneath the corpus striatum cause a rise of temperature. Thus we have discovered that a transverse section a millimetre in front of the anterior ends of the striate bodies is followed by a rapid rise of temperature, which lasts till the third day. In Fig. 1 the continuous line shows the quick rise and the slow fall of temperature. Fig. 2 shows that

FIG. 2.



heat production is immediately increased, as is also heat dissipation, but on the second day they both fell below normal. On the third day the temperature was about normal, being a little above it. This is the most anterior point in the brain which will cause any marked rise in temperature.

2. *The Caudate Nucleus* (Sachs and Aronsohn).—It was discovered by Drs. Sachs and Aronsohn that on the median side of the nodus cursorius a puncture causes a gradual increase of temperature, which reaches its height in twenty-four to seventy hours.

Girard† has also confirmed these observations. Baginsky‡ has extirpated the caudate

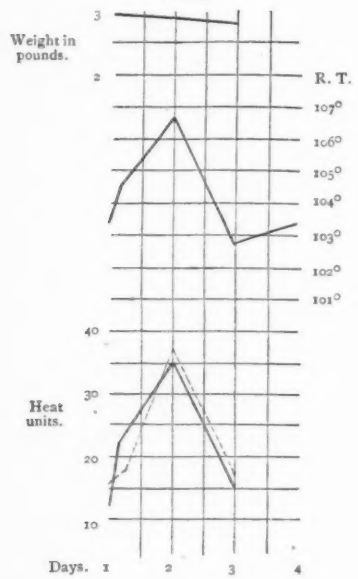
* *Journal of Nervous and Mental Diseases*, April, 1884.

† *Archives de Physiologie*, 1886.

‡ *Virchow's Archiv*, October, 1886.

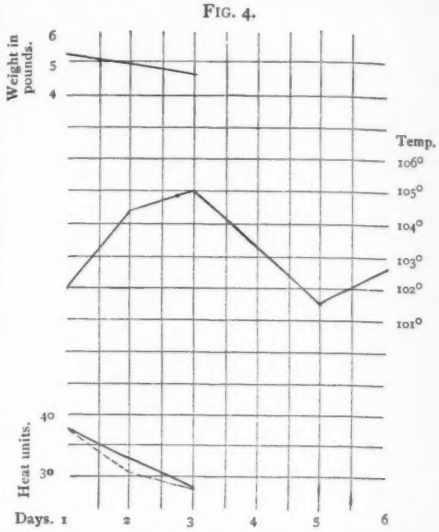
nucleus, and seen a rise of temperature. We have studied the effect of punctures in this region, and find, as they state, the rise of temperature does not reach its acme till the second day. In Fig. 1 the dotted line shows this gradual increment of temperature. This slow rise is preceded by a fall, which is not great and lasts but a short time. As to the effect of puncture on heat production and heat dissipation our researches have yielded the following results. With a falling weight, the temperature, heat dissipation, and heat production were increased, and this increase was greater next day. On the third day they fell, the temperature below normal, heat production above normal, and heat dissipation to normal. These changes are illustrated by Fig. 3.

FIG. 3.



That increase of temperature is not always a sure index of increased heat production is shown in Fig. 4, where the temperature attains its height on the third day, but both heat production and heat dissipation are steadily falling. The question now arises, Can the increase of respiration, cardiac activity, and arterial tension be the cause of the elevation of temperature in wounds of the substriate and the striate centres themselves? By examining Fig. 5 it will be seen that in an animal bound down they all rise for a short time, as also does the temperature; but when the temperature is at its height they are all falling, except the respiration is suddenly increased by allowing the animal to be unbound. From these data we think it fair to state that without doubt punctures in the neighborhood of the corpus striatum and about the nodus cursorius cause a heightened temperature, due to increased production of heat. Exceptionally, whilst the temperature

FIG. 4.



is rising, both heat production and dissipation are steadily falling.

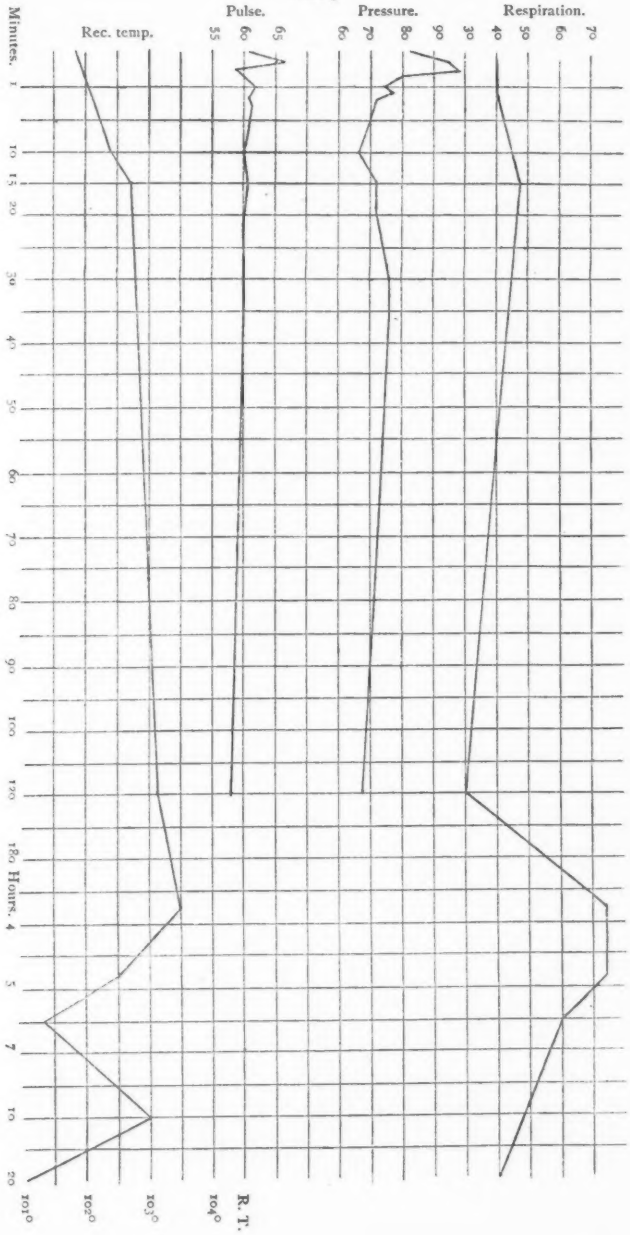
In all our experiments the weight steadily decreased, even when the animal ate with its usual gluttony.

3. *The Anterior Inner End of the Thalamus Opticus.*—We have again subjected this point to thermometric and calorimetric tests. Transverse section of the optic thalamus caused a rise when it penetrated the anterior inner part, showing that these centres are not in the base of the thalamus.

The rise of temperature after lesions at this point is rapid, attaining 109° F., and falling in six to twelve hours below normal. The continuous line in Fig. 6 illustrates this point. With the calorimeter the heat production increases with the temperature, as also does heat dissipation. These data are well shown in Fig. 7. The query also arises here, Is this increase of temperature due to accelerated circulation, respiration, and augmented arterial tension? By an examination of Fig. 8, they are all found to have been falling at the time the temperature is rising. The subsequent sudden rise of the curve of respiration is due to the unbinding of the animal. These curves show that the increase of respiration, circulation, or arterial tension has no part in the increment of heat production after injuries at the anterior inner end of the thalamus.

4. *The Heat-Centre about Schiff's Crying-Centre.*—When a puncture is made in the tissues between the optic thalamus and the corpus striatum near the median line the rabbit states that the cry occurs only in males, but we cannot confirm anything about this point, having made no careful observations. The rise of temperature here is rapid and slowly

FIG. 5.



often utters a peculiar cry, which is soon followed by increased temperature. Schiff *

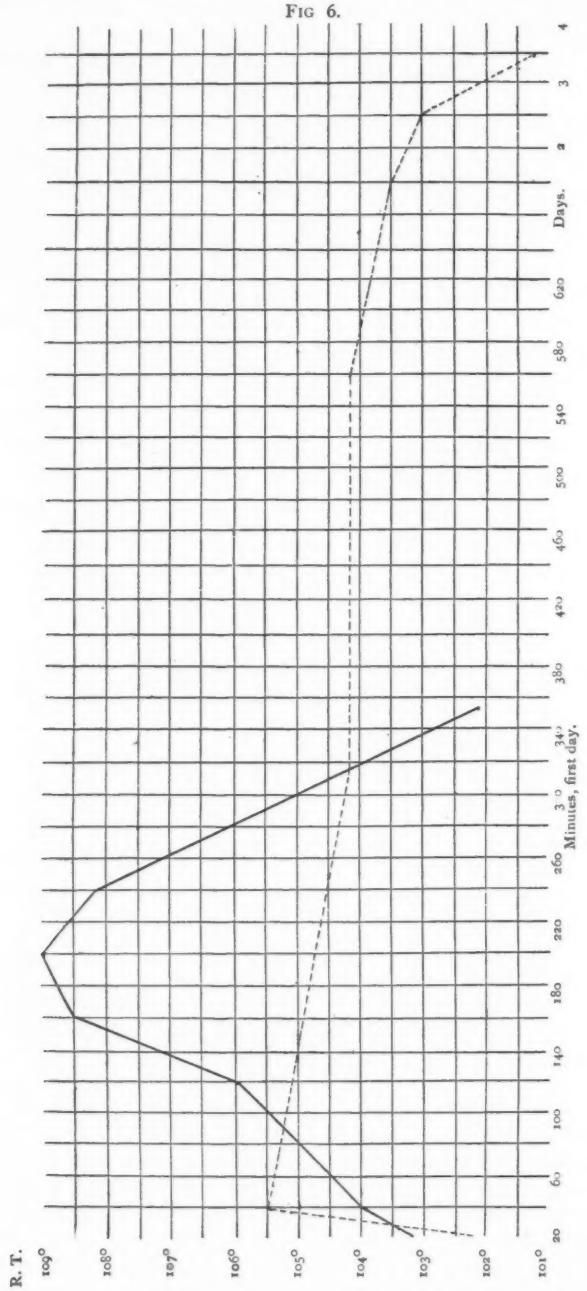
descends, not reaching normal till during the third or fourth day. The dotted line in Fig. 6 illustrates the course of the temperature. When the temperature rises heat production

* Lehrbuch der Physiologie des Menschen, 1859, p. 349.

and heat dissipation are increased, but on the following day they are below normal, although the temperature does not reach the normal level till the fourth day. A loss of weight slowly took place during these observations. All these facts are shown in Fig. 9.

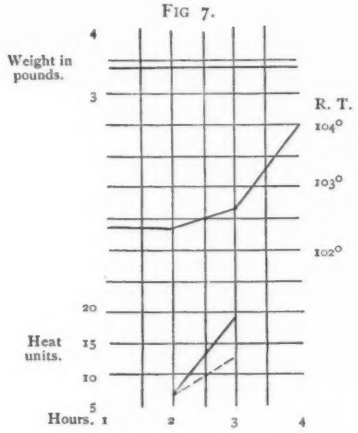
That this rise is not due to increase of cardiac action, respiration, and arterial tension is proven by Fig. 10, where at the time the temperature rises greatly they are falling. The sudden rise afterwards in respiration is due to unbinding the animal. From these observations we conclude that the heat-centre about Schiff's crying-centre does not increase heat production through the blood, its movements, or its oxidation.

FIG 6.



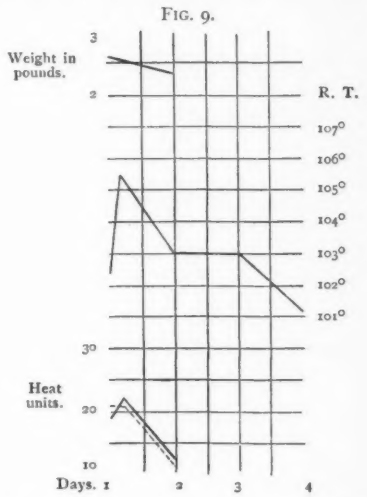
5. *The Value of the Four Heat-Centres compared with each other.*—We shall first consider the point with regard to the elevation of temperature. The anterior inner part of the

FIG 7.



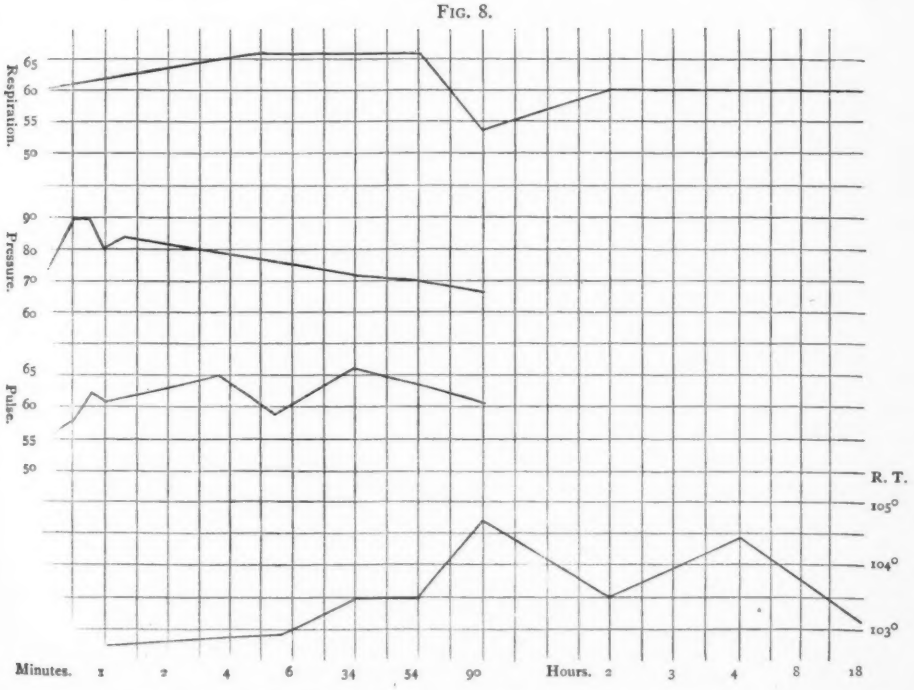
optic thalamus gives us a temperature frequently of 109° F., a rise of 6° F., whilst the highest rise to be found in any of the experiments of Sachs and Aronsohn about the

FIG. 9.



striata cause a rapid rise of temperature, which continues till the third or fourth day,

FIG. 8.



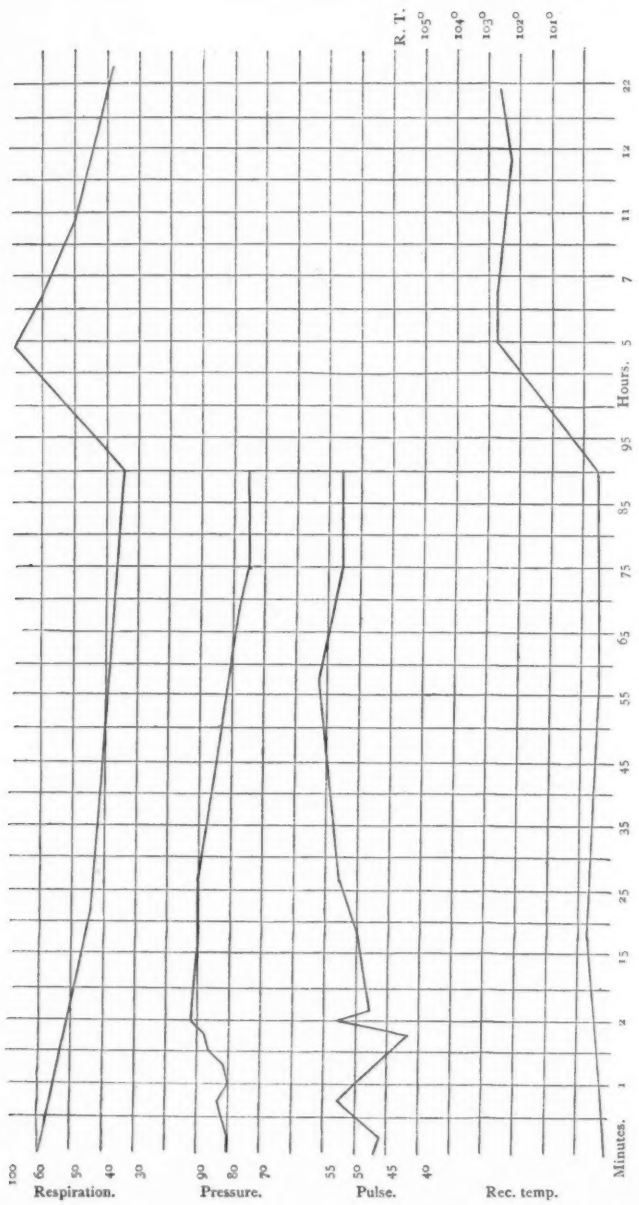
corpus striatum is 4 32° F., and this is not usual. As to duration of the elevation, the parts about the nodus cursorius and Schiff's crying-centre seem to continue up to the fourth day. Of course a division of the heat-centre on both sides of the brain will cause a greater rise than when one side of the brain is injured. The tissues beneath the corpora

but the rise is never equal to that caused by injuries of the thalamic centre. In Fig. 11 we have given the location of these centres in the brain: 1 is the heat-generating tissue be-

neath the corpus striatum; 2 is the heat-centre about the median side of the nodus cursorius; 3 is the heat-centre about Schiff's crying-centre; 4 is the centre about the anterior inner end of the thalamus.

6. *Are these Centres Exciting or Inhibitory?*—A puncture in these parts can either excite or inhibit a centre. The proof that they are exciting centres of heat rests mainly on the fact that electric irritation increases the temperature, and this increase remains. But the irritation of sensory nerves and of sensory centres makes these experiments of doubtful value. Further, the extirpation of the

FIG. 10.



The median part of the thalamus, when injured, reduces the temperature, and this reduction seems to be due to decreased production, as is seen in Experiment 8.

caudate nuclei, according to Baginsky, is followed by a rise of temperature, which reached 107.6° F. and remained high for a few days. This does not support the view of exciting centres, for then removal should be followed by a fall, or at least no rise, of temperature. According to the latest views the same centre in the central nervous system may become

FIG. 11.

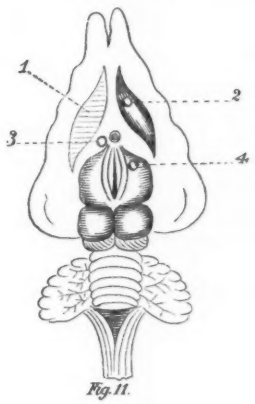


Fig. 11.

either exciting or inhibitory, according to the kind of impulses which different peripheral irritants may send into it. We believe that these centres may, under different external conditions, become either exciting or inhibitory, and that in their present doubtful nature the name of thermotaxic will be the best designation of them.

Résumé.—1. There are four cerebral heat-centres, located (1) in front of and beneath the corpus striatum; (2) the parts on the median side of the nodus cursorius; (3) the parts about Schiff's crying-centre; (4) the anterior inner end of the optic thalamus.

2. These centres are exciting or inhibitory according to the kind of impulses sent into them by the peripheral nerve-endings.

3. The respiratory and circulatory changes induced by the puncture have not any effect upon the course of the temperature generated by the heat-centres just mentioned.

4. The puncture into the thermotaxic centres either partially removes their inhibition on the spinal thermogenic centres, or causes them to become exciting centres acting in conjunction with the spinal heat-centres, and thus generating increased chemical metamorphosis of the tissues and heightened temperature.

Appended are some of the experiments upon which the preceding statements are based.

Experiment 1.—Rabbit; weight, 3.26 pounds.

Time.	Cal. temp.	Rec. temp.
A.M.		
11.00	80.45°	101.4°
M.		
12.00	81.05°	101.6°
P.M.		
12.10	The lesion was a millimetre in front of the anterior ends of both corpora striata and down to the base of the brain.	
12.24	81.05°	104.9°
1.24	81.8°	104.6°

Heat dissipation before puncture 23.13
Heat production before puncture 23.65

Heat dissipation after puncture 30.70
Heat production after puncture 31.51

Time.	Cal. temp.	Rec. temp.
P.M.		
9.30	.....	102.4°

Second day.

Time.	Cal. temp.	Rec. temp.
A.M.		
11.15	84.7°	103 3°
12.15	85.15°	103.0°

Heat dissipation after puncture 18.74
Heat production after puncture 17.96

Time.	Cal. temp.	Rec. temp.
P.M.		
9.00	.....	102.9°

Third day.

Time.	Cal. temp.	Rec. temp.
A.M.		
7.42	.....	101.8°

Experiment 2.—Rabbit; weight, 3 pounds.

Time.	Cal. temp.	Rec. temp.
P.M.		
3.50	85.65°	103.5°
4.50	87.2°	102.3°
5.00	Right corpus striatum punctured.	
5.52	.....	103.8°
6.33	86.25°	104.7°
7.33	86.7°	106.2°

Heat dissipation before puncture 16.68
Heat dissipation after puncture 18.774

Heat production before puncture 13.70
Heat production after puncture 22.50

Time.	Cal. temp.	Rec. temp.
P.M.		
8.05	.....	106.3°

Second day.

Time.	Cal. temp.	Rec. temp.
A.M.		
8.15	.....	106.5°

Experiment 3.—Rabbit; weight, 5.1 pounds.

Time.	Cal. temp.	Rec. temp.
A.M.		
9.05	83.5°	101.9°
10.05	84.4°	101.9°

Time.	Cal. temp.	Rec. temp.
A.M.		
10.10	Several punctures into anterior part of corpus striatum, about the nodus cursorius.	
10.20	.....	103.3°
P.M.		
8.10	.....	103.4°

Second day; weight, 4.96 pounds.

Time.	Cal. temp.	Rec. temp.
A.M.		
9.25	85.9°	104.5°
10.25	86.65°	104.9°

Heat dissipation before puncture 37.54
Heat dissipation after puncture..... 31.29

Heat production before puncture 37.54
Heat production after puncture..... 32.93

Third day; weight, 4.72 pounds.

Time.	Cal. temp.	Rec. temp.
A.M.		
10.05	85.2°	105 1°
11.05	85.9°	105.1°

Heat dissipation 28.99
Heat production..... 28.99

Fourth day.

Time.	Cal. temp.	Rec. temp.
A.M.		
7.00	.....	103.3°

Fifth day.

Time.	Cal. temp.	Rec. temp.
A.M.		
9.00	.....	101.6°

Sixth day.

Time.	Cal. temp.	Rec. temp.
A.M.		
9.00	.....	102.5°

Seventh day.

Time.	Cal. temp.	Rec. temp.
A.M.		
9.00	.....	103.1°

Experiment 4.—Rabbit.

Time.	Pulse.	Press.	Resp.	Air temp.	Rec. temp.
A.M.					
11.30	...	...	40	87°	101.8°
11.31	62	84	...	.....	.....
11.31.30	Puncture about nodus cursorius.				
11.31.45	60	96	...	.....	.....
11.32	63	76	40	.....	.....
11.41	60	68	...	.....	102.4°
11.45	61	72	48	.....	102.7°
12.00	60	76	...	.....	102.8°
P.M.					
1.30	57	68	30	.....	103.1°
3.15	Not bound down.		76	.....	103.5°
6.00	...	...	60	.....	101.4°
9.45	...	...	..	.....	103.1°

Second day.

Time.	Pulse.	Press.	Resp.	Air temp.	Rec. temp.
A.M.					
7.40	...	...	40	.....	101.1°

Experiment 5.—Rabbit; weight, 3.32 pounds.

Time.	Cal. temp.	Rec. temp.
P.M.		
1.55	84.7°	103.7°
2.55	85.7°	101.3°
3.00	Right corpus striatum punctured.	
3.32	.....	102.5°
8.55	.....	105.8°

Second day; weight, 3.42 pounds.

Time.	Cal. temp.	Rec. temp.
A.M.		
8.00	.....	107.1°
P.M.		
1.54	86.8°	106.9°
2.54	87.8°	106.0°

Heat dissipation before puncture 41.72
Heat dissipation after puncture..... 41.72

Heat production before puncture..... 35.04
Heat production after puncture..... 39.16

Third day; weight, 3.22 pounds.

Time.	Cal. temp.	Rec. temp.
P.M.		
2.00	86.1°	105.5°
3.00	87.05°	105.3°

Heat dissipation 39.63
Heat production..... 34.29

Fourth day; weight, 3.24 pounds.

Time.	Cal. temp.	Rec. temp.
P.M.		
2.05	81.2°	104.3°
3.05	82.2°	102.3°

Heat dissipation after puncture..... 41.72
Heat production after puncture..... 36.28

Fifth day.

Time.	Cal. temp.	Rec. temp.
A M.		
9 00	.....	103.3°

Sixth day.

Time.	Cal. temp.	Rec. temp.
A.M.		
9.00	.....	102.6°

Experiment 6.—Rabbit; weight, 2.56 pounds.

Time.	Cal. temp.	Rec. temp.
A.M.		
10.35	84.7°	102.3°
11.35	88.2°	101.9°
11.40	Puncture about Schiff's crying-centre.	
P.M.		
12.15	.....	103.5°
1.50	.....	103.2°
2.00	.....	105.5°
3.00	86.4°	105.3°
4.00	86.9°	105.1°
6.00	.....	105.0°
10.00	.....	104.3°

Second day; weight, 2.38 pounds.

Time.	Cal. temp.	Rec. temp.
A.M.		
10.20	85.6°	103.1°
11.20	86.0°	103.4°

Third day.

Time.	Cal. temp.	Rec. temp.
A.M.		
8.45	.....	103.0°
P.M.		
9.40	.....	101.7°

Fourth day.

Time.	Cal. temp.	Rec. temp.
A.M.		
9.45	.....	101.5°

Experiment 7.—Rabbit.

Time.	Pulse.	Press.	Resp.	Air temp.	Rec. temp.
P.M.					
2.16.30	51	68	60	89°	102.7°
2.16.45	Puncture into the heat-centre of optic thalamus.				
2.17.15	58	90	...	.....	.....
2.17.30	62	90	...	.....	.....
2.17.45	61	80	...	.....	.....
2.22	59	76	...	.....	102.9°
2.50	66	72	...	.....	103.5°
3.10	64	70	66	.....	103.5°
3.45	61	66	54	.....	104.2°
4.15	Unbound.	...	60	.....	103.5°
6.00	...	...	...	.....	104.4°
9.45	...	...	...	.....	103.8°

Second day.

Time.	Pulse.	Press.	Resp.	Air temp.	Rec. temp.
A.M.					
7.00	...	...	60	.....	103.1°

Experiment 8.—Rabbit; weight, 2.80 pounds.

Time.	Cal. temp.	Rec. temp.
P.M.		
1.33	75.1°	104.2°
2.33	75.9°	103.5°
	+ 8°	— 7°
2.35	Puncture into the middle of the thalamus.	
3.15	76.4°	103.5°
4.15	78.2°	104.2°
	+ 7°	+ 7°

Heat dissipation before operation..... 10.21
Heat dissipation after operation..... 10.12

Heat production before operation..... 16.29
Heat production after operation..... 11.74

Experiment 9.—Rabbit.

Time.	Pulse.	Press.	Resp.	Air temp.	Rec. temp.
A.M.					
9.40	47	80	60	90°	101.1°
9.40.45	Puncture about Schiff's crying-centre.				
9.41	50	80	...	.....	.....
9.41.15	47	82	...	.....	.....
9.41.45	41	88	...	.....	.....
9.42	53	92	...	.....	.....
9.58	50	90	...	.....	101.7°
10.06	53	90	45	.....	101.3°
11.10	53	76	35	.....	101.4°
P.M.					
2.30	Unbound.	...	100	.....	104.8°
4.10	...	...	60	.....	104.8°
8.25	...	...	50	.....	104.6°
9.20	...	...	...	.....	104.3°

Second day.

Time.	Pulse.	Press.	Resp.	Air temp.	Rec. temp.
A.M.					
8.00	...	...	40	.....	104.6°

Experiment 10.—Rabbit.

Time.	Pulse.	Press.	Resp.	Air temp.	Rec. temp.
P.M.					
1.20	50	54	60	90°	102.7°
1.20.15	Puncture about nodus cursorius.				
1.20.30	56	56	52	.....	.....
1.20.45	63	62	...	.....	.....
1.35	57	48	60	.....	102.8°
1.50	59	44	...	.....	.....
2.50	54	48	42	.....	102.7°
3.00	51	40	...	.....	.....
4.10	Animal unbound.		60	.....	103.5°
8.25	...	...	52	.....	103.3°
9.00	...	...	...	.....	103.8°

Second day.

Time.	Pulse.	Press.	Resp.	Air temp.	Rec. temp.
8.00	...	...	30	.....	102.3°

Experiment 11.—Rabbit; weight, 3.76 pounds.

Time.	Cal. temp.	Rec. temp.
A.M.		
8.40	.....	103.4°
9.40	.....	101.9°
10.00	Corpora striata both considerably injured.	
10.35	.....	102.4°
5.15	.....	101.3°

Second day.

Time.	Cal. temp.	Rec. temp.
A.M.		
7.00	.....	102.4°

Experiment 12.—Weight, 2.9 pounds.

First day.

Time.	Cal. temp.	Rec. temp.
P.M.		
2.50	85.65°	103.5°
3.50	86.25°	102.3°

Heat dissipation before operation..... 25.03
Heat production before operation..... 22.14

5.00 Deep puncture into right corpus striatum.

Second day.

Time.	Cal. temp.	Rec. temp.
P.M.		
4.00	85.8°	106.7°
5.00	86.7°	105.8°

Heat dissipation..... 37.54
Heat production..... 35.38

Third day; weight, 2.84 pounds.

Time.	Cal. temp.	Rec. temp.
P.M.		
4.00	87.8°	102.7°
5.00	88.2°	103.0°

Heat dissipation 16.68
Heat production 15.98

Fourth day.

Time.	Cal. temp.	Rec. temp.
A.M.		
11.00	.....	103.1°

Experiment 13. — Rabbit; weight, 3.2 pounds.

Time.	Cal. temp.	Rec. temp.
A.M.		
8.55	84.6°	102.7°
9.55	85.2°	102.3°
11.15	Skull trephined; puncture about the nodus cursorius.	
11.25	.....	102.3°
P.M.		
8.30	.....	102.3°

Second day; weight, 2.92 pounds.

Time.	Cal. temp.	Rec. temp.
A.M.		
9.00	79.9°	105.1°
10.00	80.6°	104.6°

Heat dissipation before puncture..... 25.03
Heat dissipation after puncture..... 29.20
Heat production before puncture..... 27.39
Heat production after puncture..... 27.99

Third day.

Time.	Cal. temp.	Rec. temp.
A.M.		
9.00	.....	105.6°

Fourth day.

Time.	Cal. temp.	Rec. temp.
A.M.		
9.00	.....	102.5°

Experiment 14. — Rabbit; weight, 4.2 pounds.

Time.	Cal. temp.	Rec. temp.
P.M.		
12.10	85.95°	101.4°
1.10	86.30°	101.7°
1.20	Puncture into right corpus striatum about the middle.	
2.10	.....	102.9°
4.00	87.2°	104.1°
5.00	87.5°	105.1°

Heat dissipation before puncture..... 14.60
Heat dissipation after puncture..... 12.51
Heat production before puncture..... 15.62
Heat production after puncture..... 15.91

Second day; weight, 3.86 pounds.

Time.	Cal. temp.	Rec. temp.
P.M.		
12.07	85.4°	104.2°
1.07	85.8°	103.9°

Heat dissipation..... 16.68
Heat production..... 15.72

Time.	Cal. temp.	Rec. temp.
P.M.		
9.35	.....	103.6°

Third day.

Time.	Cal. temp.	Rec. temp.
A.M.		
9.00	.....	101.3°

Experiment 15. — Rabbit; weight, 3.16 pounds.

Time.	Cal. temp.	Rec. temp.
A.M.		
9.55	83.95°	102.1°
10.55	84.5°	102.9°
11.30	Puncture into corpus striatum down to base of brain.	
P.M.		
2.15	85.8°	104.9°
3.15	86.38°	104.3°

Heat dissipation before puncture..... 17.38
Heat dissipation after puncture..... 18.32
Heat production before puncture..... 16.86
Heat production after puncture..... 17.01

Time.	Cal. temp.	Rec. temp.
P.M.		
3.40	.....	103.9°

Experiment 16. — Rabbit; weight, 2.62 pounds.

Time.	Cal. temp.	Rec. temp.
M.		
12.00	82.2°	102.3°
P.M.		
1.00	82.65°	102.7°
1.30	Puncture into anterior end of the thalamus, extending into the neighborhood of Schiff's crying-centre.	
2.15	.....	102.9°
3.20	.....	103.7°
4.15	83.1°	104.6°
5.15	83.78°	105.4°

Heat dissipation before puncture 18.77
Heat dissipation after puncture..... 28.36
Heat production before puncture..... 19.63
Heat production after puncture 29.99

Time.	Cal. temp.	Rec. temp.
P.M.		
8.30	.....	104.5°

Second day; weight, 2.44 pounds.

Time.	Cal. temp.	Rec. temp.
A M.		
11.52	84.4°	104.6°
12.52	85.0°	104.3°

Heat dissipation..... 25.63
Heat production 24.43

Third day.

Time.	Rec. temp.	Cal. temp.
A.M.		
12.00	.....	102.3°

Experiment 17. — Rabbit; weight, 2.62 pounds.

Time.	Cal. temp.	Rec. temp.
A.M.		
9.25	84.2°	102.5°
10.25	84.7°	101.9°
11.37	Puncture about Schiff's crying-centre and the anterior inner end of the thalamus.	
11.45	.....	102.1°
12.00	.....	102.6°
P.M.		
12.50	.....	104.1°
1.40	.....	104.3°
2.00	85.9°	104.5°
3.00	86.4°	105.9°

Heat dissipation before puncture..... 20.86
Heat dissipation after puncture..... 20.86
Heat production before puncture..... 19 56
Heat production after puncture..... 23.78

Time.	Cal. temp	Rec. temp.
P.M.		
10 00	.....	104.3°

Second day; weight, 2.5 pounds.

Time.	Cal. temp.	Rec. temp.
A.M.		
9.20	85.3°	102.3°
10.20	85.6°	101.9°

Heat dissipation..... 12.51
Heat production..... 13.76

Time.	Cal. temp.	Rec. temp.
A.M.		
11.00	....	102.3°
11.30	Killed.	

Experiment 18.—Rabbit.

Time.	Cal. temp.	Rec. temp.
P.M.		
3.30	.....	102.8°
3.35	Injection of solution of chromic acid into the anterior inner end of the right corpus striatum.	
3.50	.....	101.5°
4.00	.....	102.8°
4.05	.....	103.3°
4.10	.....	102.5°
4.15	.....	101.3°
5.55	.....	102.5°
7.20	.....	102.3°
8 41	.....	102.5°

Experiment 19.—Rabbit.

Time.	Pulse.	Pressure.	Rec. temp.
P.M.			
2.00	54	60	101.9°
	Puncture into right corpus striatum.		
2.00.15	62	64	.....
2.00.30	72	56	.....
2.00.45	53	58	.....
2.01	55	58	.....
2.01.30	38	40	.....
2.01.45	38	30	.....
2.10	...	...	101.6°

Experiment 20. — Rabbit; weight, 5.10 pounds.

Time.	Cal. temp.	Rec. temp.
P.M.		
1.45	.....	103.9°
2.48	The anterior ends of corpora striata divided down to the base of the brain through nodus cursorius.	
3.00	.....	103.4°
3.45	.....	105.3°
4.30	Died.	

Experiment 21.— Rabbit; weight, 4.04 pounds.

Time.	Cal. temp.	Rec. temp.
A.M.		
10.50	.....	103.2°
10.55	Puncture at the anterior inner end of the thalamus.	
11.20	.....	104.0°
1.15	.....	105.1°
2.15	.....	108.4°
3.10	.....	109.0°
3.40	.....	108.3°
4.38	.....	104.6°
5.30	.....	102.1°

Experiment 22.—Rabbit.

Time.	Cal. temp.	Rec. temp.
P.M.		
12.15	.....	$103\frac{5}{8}°$
12.16	A transverse puncture made through the temporal region into the anterior end of the thalamus.	
12 18	.....	$104\frac{1}{2}°$
2.20	.....	$105\frac{3}{8}°$
4.00	.....	$106\frac{1}{8}°$
6.00	.....	$106\frac{1}{4}°$
7.00	.....	106°

Second day.

Time.	Cal. temp.	Rec. temp.
A.M.		
7.00	.....	$104\frac{5}{8}°$

Experiment 23.—Rabbit.

Time.	Cal. temp.	Rec. temp.
P.M.		
1.55	.....	102.5°
	An eighth of an inch back of the main heat-centre in anterior inner end of thalamus.	
2.42	.....	104.3°
3 45	.....	105.0°
4.35	.....	104.4°
6.20	.....	104.3°
7.00	.....	103.8°
8.00	.....	102.9°

Experiment 24.—Rabbit.

Time.	Cal. temp.	Rec. temp.
P.M.		
2.44	.....	103.3°
	Puncture in thalamic heat-centre; cortex not injured.	
2.45	.....	103.3°
3.00	.....	103.5°
4.05	.....	105.4°
5.45	.....	105.5°
7.45	.....	105.1°

Second day.

Time.	Cal. temp.	Rec. temp.
A.M.		
8.10	.....	102.3°

Experiment 25.

Time.	Cal. temp.	Rec. temp.
P.M.		
4.25	.....	103.3°
4.26	Puncture in the thalamic heat-centre; cortex at base slightly involved.	
5.45	.....	105.4°
7.45	.....	106.1°

Second day.

Time.	Cal. temp.	Rec. temp.
A.M.		
8.10	.....	101.3°

Experiment 26.—Rabbit.

Time.	Cal. temp.	Rec. temp.
A.M.		
7.42	.....	101.8°
7.43	Puncture into anterior inner end of the optic thalamus.	
7.45	.....	103.3°
9.25	.....	104.3°
10.15	.....	104.8°
10.50	.....	105.3°
	Animal killed.	

A NEW METHOD OF TREATING PHTHISIS BY SUPER-ALIMENTATION.

Dr. Langowai, of the clinical staff of Professor Ostronmoff, in Moscow, has used with good results the following treatment, which he reports in the *Pharmaceutische Zeitschrift für Russland*, 1887, No. 24. Reviewing the mortality from phthisis, Langowai estimates that two-thirds of all deaths from chronic illness are from phthisis; he passes over with a brief mention the various germicides proposed to destroy the tubercle-bacillus, and describes at length the method of the French physician Debove, who, in treating a case of phthisis which was unable to retain food, had washed out the stomach, and so secured freedom from nausea and vomiting; he introduced through a stomach-tube extra diet into the patient's system—milk, soup, and eggs—with a favorable result: the cough and night-sweats grew less, and there was a gain in body weight of fourteen pounds in three months. Further investigations by Debove proved the increased assimilation of food by the increase in the urinary constituents excreted, which rose from a proportion of sixty to that of eighty. Later in his treatment Debove added meat-powder to his other articles of diet, in quantities of from six drachms to twenty-five ounces daily. He was followed by a large number of other experimenters. For his investigations Langowai selected five cases of phthisis in the Moscow Clinic, in whom every means of diagnosis proved the existence of the disease in pronounced form. It was found that those cases in whom the parenchyma of the lung was not badly diseased sometimes recovered perfectly, while the worst cases were maintained for a long time. Langowai used in his treatment milk and meat-powder, the latter of which was prepared as follows: the best quality of meat was carefully freed from tendon and fat, and reduced to fine hash in a chopping-machine; it was then carefully dried in an oven at a temperature not exceeding 50° C. After drying the meat was powdered in a mortar and put through a fine, but non-metallic, sieve; the product was a fine powder, free from tendon, and having a faint odor of flesh. When the temperature was higher than 50° C. the meat was burned, and emitted an unpleasant odor. This meat-powder was kept in well-corked glass vessels, in a cool, dry place. By the method thus described neither the chemical nor histological properties of the meat were destroyed, the latter of which is especially important, as the microscope can reveal the addition of foreign substances in preparations offered for sale. The only change which the meat underwent was the loss of water, and this occurred in the proportion of three-fourths its body weight. To meet an objection which may possibly be raised by reason of the cost of the meat employed in making the powder, Langowai proposes the substitution of horseflesh for such as is generally employed. This meat is but little inferior to beef, as will be seen when we compare the two:

	Beef.	Horseflesh.
Salts, albumen, etc...	13.8 per cent.	12.5 per cent.
Phosphoric acid.....	1.69 "	1.66 "

Horseflesh is as well digested and gives as good results as beef. The above analysis is taken from Rubin. The meat-powder is given in sweetened water, with the addition of wine or peppermint-water. It may also be given in milk, soup, or spread upon bread with butter and cheese. Langowai gave his patients an amount of this powder equal to three pounds of meat. The merits of this treatment are sufficiently great to warrant apothecaries in preparing and keeping such meat-powders.

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Leading Articles.

AMYLENE HYDRATE—A NEW HYPNOTIC.

AMYLENE HYDRATE is the most recent and promises to be one of the most important of the many late additions to the list of hypnotics. For its introduction we are indebted to Prof. J. von Mehring (*Therapeutische Monatshefte*, July, 1887). This substance, which belongs to the group of tertiary alcohols, was first discovered by Wurtz, and is prepared by treating trimethylethylene with sulphuric acid, amyl sulphuric acid being formed as an intermediate stage and breaking up on distillation with water, the tertiary alcohol being formed. Its more correct scientific name is dimethylethylcarbinol, and is represented by the formula $C_5H_{12}O = (CH_3)_2C(C_2H_5)OH$. Amylene hydrate is described as a clear, colorless liquid, with a penetrating odor, recalling camphor, oil of peppermint, and paraldehyde. It has a specific gravity of 0.81 ; when pure it boils at 102.5° Centigrade. Upon cooling it to 12.5° it solidifies in acicular crystals that melt at 12° Centigrade. It dissolves in 8 parts of water, and is miscible with alcohol in all proportions. Amylene hydrate appears to be specially liable to contamination with amylic alcohol, which may be detected if present by the formation of valerianic acid upon oxidation with potassium bichromate and sulphuric acid.

In 1885 Von Mehring and Thierfelder (*Zeit. f. Phys. Chemie*, Bd. 1. s. 9) showed that when this substance was given to rabbits it was excreted as a compound of glycuronic acid, but in man and dogs was, to the greater part, as is ordinary alcohol, subjected to combustion. These experiments indicated that this substance was, in all probability, possessed of marked hypnotic properties, and for the last two years Von Mehring has been extending his experiments in this direction both on animals and on man, and he now announces that as a hypnotic amylene hydrate stands midway between chloral hydrate and paraldehyde, one gramme of chloral hydrate being estimated as equal to two drachms of amylene hydrate or three drachms of paraldehyde. His experiments were first made on frogs, rabbits, and dogs, and he found that hypodermic injections of 0.06 to 0.1 gramme in a frog, or 2 to 3 grammes introduced into the stomach in rabbits or 8 grammes in dogs, produced within ten to thirty minutes a deep sleep, which lasted from six to eighteen hours, animals appearing perfectly normal when the effects of the hypnotic pass off. In these doses, which were found amply sufficient to produce profound narcosis, scarcely the slightest impression was made upon the respiratory functions, respiration in the dog being reduced from twenty only to sixteen respiratory movements in the minute, a difference which is no more marked than occurs in normal sleep. The circulation likewise is scarcely affected by this drug, differences in the pulse-rate and blood-pressure after the administration of amylene hydrate being scarcely perceptible, a marked contrast to the serious effects often produced by chloral. The physiological action of this substance appears to be exerted principally upon the cerebrum. In larger doses it extends to the medulla oblongata, reflex action disappears, respiration slackens, and finally the heart stops. In doses suitable for the production of narcosis neither the respiration nor the heart's action are perceptibly affected, and Von Mehring states that he has even administered this drug to patients with extensive heart-defects with the most satisfactory results.

In all he has given amylene hydrate to sixty different individuals in three hundred and fifty different doses, each dose varying from 3 to 5 grammes (50–90 gtt.). The affections in

which he employed this substance were of the most varied character,—sleeplessness from nervousness, in delirium tremens, phthisis, and in convalescence from various febrile diseases. Only in four cases out of all these did it prove inefficacious. Twice it was employed in whooping-cough with a favorable result, but, like chloral, it proved unreliable in producing sleep when the wakefulness was due to pain. It is said to possess a less disagreeable taste than paraldehyde, and the exhalations after taking it are not so disagreeable. From its freedom from danger and more pleasant taste it is evidently to be preferred to either chloral or paraldehyde, even though it be weaker, as a hypnotic, than chloral. It may be administered internally or in enemata. Von Mehring gives the following formula :

Amylene hydrate, 7 grammes;
Aq. dest., 60 grammes;
Extr. liq., 10 grammes. M.
S.—The half to be taken at night for sleeplessness.

Amylene hydrate, 5 grammes;
Aq. dest., 50 grammes;
Mucilag. gummi arab., 20 grammes. M.
S.—For use as an enema.

In sleeplessness from pain amylene hydrate may with advantage be combined with hydrochlorate of morphine. No unpleasant after-effect of any kind, according to Von Mehring, follows the employment of this substance ; no nausea, vomiting, headache, or disturbance of digestion.

It must not be forgotten that hypnone, methylal, cannabinone, paraldehyde, hyoscine, and urethan, when first brought before the medical profession, were all supported in the strongest possible manner, and nearly every report of their employment was of the most favorable character. It was only as our experience became more extensive with these different substances that we found the use of one and all of them was in many cases attended by serious drawbacks. Perhaps amylene hydrate may prove no exception to this rule, although it must be confessed that its prospects as yet appear very promising.

A NEW VERMIFUGE.

DR. M. MARTINET writes to *Les Nouveaux Remèdes* for July, 1887, attributing vermicidal properties to the leaves of the *Sida Floribunda*. It appears that for the discovery of this substance M. Martinet was indebted to the instinct of his dog, which, after having been sick for a number of days, himself sought out and devoured some leaves of this plant, and a few hours later was relieved at the same time of his sickness and a large number of intestinal worms. The plant is said to be very common in the neighborhood of Lima, and is a Malvaceæ of the genus Sida, and is designated under the name of *Sida Floribunda*. The mucilage, which is so abundant in the different species of Malvaceæ, is likewise present in this plant, but no substance can be discovered on chemical analysis to which its anthelmintic properties could be attributed. Microscopic examination, however, shows that all the leaves of this plant are covered with extremely minute resisting spines, and the vermicidal properties are, if present at all, without doubt to be attributed to the mechanical action of the plant. Their smallness enables them to escape destruction in mastication, and their structure, being composed almost entirely of cellulose, protects them from digestion, and, reaching the small intestine, they act as a mechanical vermifuge, in the same manner as kamala, which likewise should be included among the group of mechanical vermifuges.

ONE OF PASTEUR'S CRITICS.

ONE of the most amusing of the many wild criticisms to which Pasteur's anti-rabic investigations have been subjected appears in a recent number of the *Contemporary Review*, over the signature of Frances Power Cobbe. Miss Cobbe, we believe, is one of the shining lights of the English Society for the Suppression of Vivisection, and she finds her explanation of both the appointment and the favorable character of the report of the English Hydrophobia Commission in the determination of the English physiologists to obtain at any price any argument for doing away with the restrictions on English vivisection.

Miss Cobbe recognizes that if Pasteur's conclusions were true the best possible argument for abolishing restrictions on vivisection would be afforded, but she directly claims that the only reason why Pasteur's experiments have attracted the attention of all scientists is to be found in their cruelty.

"If Pasteur's vaunted remedy had been obtained without any cruel experiments; if he had professed to cure hydrophobia by a method brought to light by clinical or microscopical observation, would he have been welcomed by the men of science of England as an illustrious '*savant*'? Tell it to the marines."

Reports on Therapeutic Progress.

PILOCARPINE IN PUERPERAL ECLAMPSIA.

At a recent meeting of the South Australian Branch of the British Medical Association MR. J. H. S. FINNISS, M.B., C.M.Edin., related a case of puerperal eclampsia in a woman, aged 24, treated by hypodermic injections of nitrate of pilocarpine (*British Medical Journal*, July 16, 1887). The first seizure occurred twenty-one hours after delivery; the fit was preceded by severe headache. Resort was at first had to chloral and bromide of potassium, combined with the administration of ether during the epileptiform fits, but without much benefit. The first dose of nitrate of pilocarpine ($\frac{1}{5}$ of a grain) was administered hypodermically at 7 A.M., thirty-seven hours after delivery. Within a minute or two profuse perspiration came on, and saliva poured out of her mouth; the pupils contracted a little. She had five more convulsions, with stertorous breathing in the intervals, up to 8 A.M., when the dose was repeated. She had had three more convulsions up to nine o'clock, but these were milder and shorter. During each fit ether was administered to assist in lessening arterial tension. She had no other fit until 2 P.M., she had another at 2.30 P.M., and a very severe one soon after 3 P.M. Nitrate of pilocarpine, $\frac{1}{3}$ of a grain, was injected; it produced the same physiological action as in the morning. At 8 P.M. she had slept for three hours; the temperature was 104.2°; she was still unconscious; she passed urine and her motions in bed, but had had no more convulsions since the third injection. At seven o'clock the next morning her temperature was 103°; she had had no return of the convulsions, and had slept at intervals through the night, but was still unconscious. At 8 P.M. of the same day the temperature was 98.2°; she had had a good calm sleep for three hours in the afternoon. She subsequently progressed favorably. There was a trace of albumen in the urine when it was examined on the second day.

WARNINGS ABOUT THE USE OF ACETANILIDE.

Two articles have recently appeared in the Hungarian medical journal *Gyógyászat*, in which the profession is warned that acetanilide, or antifebrin as it is called, though it is not without value, is an uncertain, and indeed a dangerous, antipyretic. Dr. Géza Dulácksha finds, after giving the drug a prolonged trial in the hospital, that small doses may bring down fever, but that in some cases even 3-grain doses produce violent sweats, prostration, and hemorrhage or cyanosis. It does not appear to him to exert any favorable action on the course of the disease itself, being thus inferior to salicin, resorcin, and ichthyol. If given at all in fever, its action requires to be very carefully watched. In certain neuroses, however, Dr. Dulácksha has found it very useful, and as the doses required were smaller, he is disposed to recommend its employment in such cases as it appears to be free from danger. In a case of severe trigeminal neuralgia, in which quinine, gelseminum, and morphine had produced but little improvement, 3 grains of acetanilide were given night and morning without effect; 7½ grains were then ordered, divided into ten powders, one to be taken every two hours. This produced a great improvement, and after ten days of this treatment the cure was complete. No unpleasant effects beyond some nocturnal perspiration showed themselves. Two other cases, where severe pain was associated with meningo-myelitis and syphilitic tabes respectively, which had been treated in various ways unsuccessfully, were greatly benefited by acetanilide, no unpleasant effects being produced. Dr. Biro gave acetanilide in eighteen cases of various kinds, including typhoid, croupous pneumonia, pleurisy, polyarthritis, tuberculosis, and phthisis, in doses varying from 1½ grains to 45 grains per diem, and was much struck with the uncertainty of its action, an effect being sometimes produced by a grain and a half, while at others ten or eleven grains had no effect at all. Most of the patients complained of chilliness, while cyanosis and irregularity of pulse occurred in several cases. In one case, where seven grains and a half had been taken, there was a severe rigor followed by cyanosis, sweating, and an irregular, thready pulse, the symptoms being so alarming that recourse was had to brandy and hypodermic injections of ether. In another case, in which acetanilide had been given for eleven days, similar symptoms presented themselves, together with clonic spasm of the lower extremities, reminding one of the symptoms in aniline-poisoning. Altogether, Dr. Biro thinks that the evil effects of acetanilide are so great that it cannot be recommended for general adoption.—*The Lancet*, July 9, 1887.

THE TREATMENT OF SEVERE CASES OF BURNING BY THE HEBRA WATER-BED.

The method of treating burns by prolonged immersion in baths does not seem to be as thoroughly known as it undoubtedly deserves to be. The bed recommended by Hebra is simply a special form of bath, and is admirably adapted for treating not only cases of burns, but all diseases associated with loss of epidermis, such as extensive sloughing ulcers, erysipelas, and other diseases associated with severe pain. The entire absence of pain and apprehension on the part of the patient, associated with the removal of old dressings and application of fresh ones, is a marked and favorable element in treatment by the bath. The wounded surfaces are continually out of contact with the air, and, as they are not covered with any form of dressing, the discharges escape at once into the water, and the wounds are kept clean.

There is scarcely any limit to the time a patient may remain in the bath. Immersions have been prolonged as much as three hundred and eighty-five days and nights. In the *Edinburgh Medical Journal* for July, 1887, Dr. W. J. Lawrie gives the following description of the employment of Hebra's water-bed:

It consists of a zinc vessel, constructed in the framework of a bed. In the vessel an oblong iron frame is suspended by chains. The frame is so constructed that the portion where the patient's head is to lie may, by a hinge motion, be raised to an angle with the other part. The whole frame can be raised or lowered by means of toothed wheels. On the frame a thin mattress is laid; the patient rests on the mattress. When the zinc vessel has been filled with water, the bed, carrying the patient, is gradually sunk beneath the surface, taking care, of course, to keep the head out of water.

At first the patient feels the water too hot, upon which it must be cooled. Feelings of rigor now set in, and additional warm water must be added. After this he feels most comfortable; the pains have almost entirely disappeared.

The water-bed does not offer a remedy against the severe constitutional effects of all burns, nor against their fatal ending in all cases. Patients die of extensive burns under this treatment as under any other, but they die at least free from pain.

On the other hand, the continual bath is an effectual therapeutic agent, and a real benefit for patients and attendants during the long period of suppuration. By the ordinary methods such patients cannot be kept in a state of perfect cleanliness, because the dressing of extensive burns requires much time. Lifting and turning, as well as separation of the adhering bandages, are most painful. Here fresh bleeding is induced, there retention and degeneration of the secretions occur, and fever is constantly maintained. There is continual dread of septicæmia, and constant nervous apprehension on the part of the patient at each dressing of the wounds. All of these disadvantages cease on the use of the water bed. The patient lies and moves as he wishes, sleeps, eats, and employs himself according to his tastes. The wounds are always covered, always clean, and granulate normally, indeed often so luxuriantly that they must be repressed.

According to those indications, therefore, Hebra's water-bed is, from the beginning, the best agent against pain, and during the period of suppuration is the best therapeutic agent. Removal of scabs takes place earlier. Retention of pus is avoided. Danger of septicæmia and erysipelas is reduced to a minimum, fever ceases, sleep and appetite return, by means of which the organism is enabled to withstand the effects of severe suppuration. In a word, granulation and healing, with the absence of all subjective and objective accompaniments, are furthered to an extraordinary degree by the water-bed.

TREATMENT OF ANAL FISSURE AND HÆMORRHOIDS BY GRADUAL DILATATION.

Anal fissure, or irritable ulcer, according to statistics, ranks third in frequency among the diseases of the rectum, is found in the infant as well as in the octogenarian, and is due principally to the passage of hardened fæces through the sphincters. Although insignificant in character, it causes fully as much exquisite agony as any ill that human flesh is heir to. Very many simple fissures get well promptly, but where, by frequent mechanical irritation, they come to stay, it is then that beneficial treatment is desirable. Many cases will, however, refuse a radical operation, and for this reason Dr. H. O. Walker (*New York Medical Journal*, July 30, 1887) recommends the treatment of such cases by gradual dilatation. He was led to employ this process in a case which refused operation, and in which various forms of treatment by suppositories failed to produce relief. Dr. Walker

in this case introduced a bi-valved rectal speculum, slightly separating the blades, and allowing them to remain *in situ* for about two minutes. This procedure was continued daily, gradually increasing the dilatation at each sitting until the blades were separated to their fullest extent,—about two inches in diameter. This treatment was continued until there was an entire subsidence of all previous symptoms, with a full healing of the fissure and hæmorrhoidal tumors and disappearance of constipation; entire treatment lasting about five weeks. Dr. Walker likewise reports in detail four other cases taken from a record of upwards of fifty, which he has treated by this method, and which he considers are fair representatives of the character and results of the whole In all of these cure was produced. In conclusion, he recommends the treatment of anal fissure and hæmorrhoids by gradual dilatation on the following grounds:

1. It is almost painless, at least after the first two or three distentions.

2. It does not tear the parts, nor does it produce paresis, as occasionally occurs after forcible dilatation.

3. Neither does it leave cicatrices that are apt to produce stricture, as in the method of hypodermic injection or ligature of hæmorrhoids.

ANILINE CAMPHORATE.

Referring to the fact that the recent discovery of antipyretic properties in acetanilide ("antifebrin") has opened up a possible future in therapeutics for another group of compounds, aniline derivatives and salts, HERR VULPIUS points out that a compound of aniline and camphoric acid had previously been credited by Tomaselli with antispasmodic properties (*Pharm. Centralh.*, June 9, p. 283). This salt does not usually figure in trade-lists, but Hager, in his *Handbuch der Pharmaceutischen Praxis* (vol. i. p. 364), states that it can be prepared by dissolving fifty parts of camphoric acid ($C_{10}H_{16}O_4$) in one hundred and fifty parts of absolute alcohol, and adding to the solution fifty-six parts of aniline, or sufficient to produce a neutral liquid, which is then left to evaporate spontaneously in a dark place. The product so obtained is described as occurring in small white or reddish odorless prisms, having a pungent acrid taste, and easily soluble in water, alcohol, and ether. This formula is objected to by Herr Vulpius on the ground that excess of aniline is ordered, and that it is difficult to ascertain the exact point of neutralization with ordinary indicators, paper stained with the violet coloring-matter of dahlia petals, which is colored green by aniline, being the most convenient. Moreover, he considers the use of alcohol as unnecessary, and liable to lead to discoloration during evaporation, even in the dark. He prefers to heat together in a closed vessel, at the temperature of a boiling water-bath, one hundred parts of finely-powdered camphoric acid and ninety-three parts of aniline. The crystallization of the aniline camphorate is said to commence in a few minutes but to take some time to complete, though its progress is accelerated by contact with a wide surface of the containing vessel. Aniline camphorate —(CHN)CHO—thus prepared, is said to dissolve in alcohol and ether, but not freely in water, of which it requires about thirty parts, and in its solubilities generally it approximates to aniline rather than to camphoric acid. Chloroform and carbon bisulphide appear to break up the compound, taking up the aniline and leaving a residue of camphoric acid; heated fat oils and oil of turpentine behave more or less similarly. Apart from alcoholic and ethereal solutions which are not adapted for hypodermic use, the best solvent for aniline camphorate is glycerin, which takes up one-tenth of its weight, and can then be diluted with an equal weight of water. The maximum single dose of aniline camphorate given by Tomaselli as an antispasmodic was .02 gramme, and the maximum quantity administered in one day .08 gramme, which was usually given dissolved in four volumes of ether or ether-alcohol, and inclosed in a gelatin-capsule.—*Pharmaceutical Journal and Transactions*, June 25, 1887.

THE TREATMENT OF NEURALGIA BY MEANS OF INTENSE COLD.

At a recent meeting of the American Neurological Association, DR. JACOBY read a paper on this subject, in which he set forth the advantages attending the use of chloride of methyl and liquid carbonic acid (*New York Medical Journal*, July 30, 1887). His general impression was that we had in chloride of methyl a reliable analgesic which did not affect the general condition of the patient, and that it was invaluable in the treatment of neuralgia for the immediate relief of severe pain. It was used in the form of spray under high pressure. The objections to be overcome were the expense of the apparatus and

the difficulties of getting the drug. From his experience in the use of condensed carbonic acid, his conclusions were that, in the absence of chloride of methyl, it was able to take the place of that remedy in the treatment of sciatica; that the pain was relieved very promptly by it, but that its curative effect was not so great as that attributed to the chloride of methyl by other observers.

Dr. Edes and Dr. Dana had used rhigolene with benefit in the treatment of neuralgia, and so had Dr. Jacoby, but he had found it objectionable because of the less intense degree of cold produced, and also because it could not be applied to a sufficiently large surface.

TREATMENT OF DROPSY BY PERMANENT BATHS.

In the course of a paper (*Berl. Klin. Woch.*, 1887, No. 29) upon the use of permanent baths (at a temperature of about 95° F.), L. RIESS, after giving instances of their value in cases of spinal disease and injury, adduces some rather remarkable facts of their efficacy in the treatment of dropsy, whether cardiac or renal. These cases are often complicated with bed-sores, erysipelas, and gangrene, for which such treatment would be suitable, but he says that he long withheld it because of the idea that cardiac or pulmonary disease would be a contraindication to its employment. However, in 1879, in a case of extreme cardiac dropsy (mitral and aortic disease) with considerable erysipelas and cutaneous gangrene of the legs, he determined to try the effect of the permanent bath as a last resort, not without some misgiving lest the immersion should increase the dyspnœa and dropsy. The result proved quite the reverse, for a rapid improvement took place, and when, after having been in the bath a fortnight, the patient returned to bed, the dropsy and other severe symptoms had disappeared. Since then Riess has adopted the procedure in a large number of dropsical cases, and invariably with benefit, the dropsy in most cases (whether renal or cardiac) diminishing within the first forty-eight hours in a striking degree. The quantity of urine is not increased *pari passu*, so that it is suggested that the effect of the permanent bath is to increase the functional activity of the skin, which is contrary to the prevalent notion. The good results obtained in cases of chronic rheumatism so treated are also mentioned, and it is held that the application of the method is practically very simple, it being necessary of course to allow the patient to lie comfortably suspended in a hammock, and to place a thick woollen covering over the bath to retain heat as much as possible. At first it is well to allow the patient to leave the bath at night, but, as he gets more used to it, he may spend days and nights in it with much comfort both to himself and his attendants.—*The Lancet*, July 23, 1887.

NAPHTHOL IN THE TREATMENT OF ENURESIS.

DR. S. J. WRIGHT, of Tallmadge, O., writes to the *Medical Record*, July 30, 1887, as follows: "I had a case of enuresis, without cystitis or calculus or any pain, occurring in a neurotic lady 34 years old. The condition had existed since childhood. No relief had been found in local or general treatment. She had been obliged to rise many times every night for years. The quantity of urine passed each time was small, the total amount for the twenty-four hours being about three pints. A nervous cough had lasted a year in spite of treatment, and, fearing bacterial infection, I gave her a No. 2 capsule filled with naphthol, also using the drug in the form of a spray. The enuresis rapidly subsided during this treatment, although no change was visible in the appearance of the urine. A temporary cessation of the naphthol for a few days was promptly followed by a return of the enuresis, which again left on resuming the drug. She is now free from enuresis, and can sleep better than ever before. Her throat gives her no pain, her cough is nearly gone, and she can omit naphthol without a return of her enuresis."

COMMON ERRORS IN THE TREATMENT OF SKIN-DISEASES.

At a recent meeting of the Medico-Chirurgical Society of Montreal, DR. FOX read a paper on the "Common Errors in the Treatment of Skin-Diseases" (*The Canada Medical Record*, June, 1887). He said that the great error made by practitioners in treating skin-diseases was failure to treat the patient; the disease is treated, not the patient. It is most important that the patient have fresh air, wholesome food; in short, everything that tends to improve the general health. Special treatment of the disease is of no avail without improving the condition of the patient. He regarded attention to the diet as most important, and said there should be a radical

change both in the quantity and quality of the food; a strict course of diet should be given the patient; the majority of patients improve on starvation diet. He advised his patients to increase the quantity of fluids taken and decrease the solids; to eat less and exercise more. A change of diet almost invariably proves of value, the more radical the better; he gets the best therapeutical effects from a vegetable diet in the treatment of inflammatory skin-affections. A meat diet congests the skin; a vegetable diet relieves the congestion. He is in the habit of restricting the meat in winter and forbidding it in summer. In giving directions to a patient it is better to tell them what to eat than what to avoid. Water should be taken sparingly at meals, but in quantity between meals. In speaking of local applications, he said that very few are needed. If the disease be acute, soothing applications should be given; if chronic, stimulating ones. Infantile eczema is, as a rule, too much stimulated, and chronic eczema with infiltration too little stimulated. In treating psoriasis, chrysophanic acid is the best remedy, but even this remedy should not be used in every case, as it does positive injury where there are congestion and inflammation, but later, when the eruption becomes dry, it does good. In acne a tonic treatment is best. In speaking of local applications, the reader of the paper stated that when the substance is needed to be absorbed by the skin, then the animal fats should be used; when mere protection is wanted, then vegetable fats do very well. Vaseline has but little power of penetrating the skin. He then went on to speak of arsenic, which, he said, is used too much by the general practitioner in the treatment of skin-diseases, and which, as regards skin-diseases, would not be missed if abolished from the Pharmacopœia; he now rarely uses it. It is at best a much overrated remedy, and its indiscriminate use in skin-diseases is fraught with evil.

A NOVEL TREATMENT OF PLACENTA PRÆVIA.

Dr. John Winslow, of Ithaca, N. Y., writes to the *Medical Record* for July 30, 1887, as follows: "The interest lately shown by your correspondents in the subject of placenta prævia leads me to report a case whose treatment differed from any that I have seen described. Summoned in haste one night to a stout German primipara, I was at her bedside in less than five minutes after the messenger had left it. The blood had already saturated the bed, made a pool under it, and flowed across the room. It was still pouring from the vagina, when, introducing the whole hand, I found the os about the size of a half-dollar, with the presenting placenta so firmly adherent all around that it could nowhere be detached, and too thick and firm to be penetrated by the finger. So, to check the hemorrhage, I closely applied the palm over the os (with the fingers in the posterior cul-de-sac, as the patient lay supine), while the external hand over the fœtal breech strongly held the head against the placenta, the lowest part of which was thus firmly compressed. Hemorrhage was impossible, and not another ounce of blood was lost until, after four fatiguing hours of this steady pressure, the os had so far dilated as to allow one edge of the placenta to slip out, forced down by the head, which now of itself compressed the attached portion against the pelvic wall. Delivery was spontaneous and speedy; and the large, thick after-birth showed near its centre a circle some four inches in diameter much thinned and completely blanched. Both mother and child did well."

A NEW TREATMENT FOR OBSTINATELY RECURRING ECZEMA.

When the diathetic or other defect of health upon which most cases of eczema depend is duly met by general and medicinal measures, and the local applications are adapted to the stage and degree of inflammation, while the denuded surface is protected from the irritating influences of air and water, the vast majority of cases get well; but, in a certain number, just when we think that we have conducted the patient safely through the attack, a fresh outbreak occurs and we have to begin again, and this over and over again until the resources of the medical men and the patience of the sufferer are wellnigh exhausted.

In the *British Medical Journal* for July 9, 1887, Dr. Radcliffe Crocker proposes a means of treating these disheartening cases, which he believes will bring relief in the majority of instances. He was first induced to try this treatment in the case of a man, aged 56, who had had eczema on the hands and face, and had been incapacitated for work for three years. Various kinds of treatment were tried, both internal and external; but, although temporary improvement was obtained so that the discharges and hyperæmia diminished and he seemed to be getting well,

in a few days the eruption came out again as badly as ever, chiefly on the face and arms. Dr. Crocker came to the conclusion that it must be due to a vaso-motor neurosis, and that if he could get at the vaso-motor centre he might do some good.

Without in any way altering the treatment previously employed, he painted liquor epispasticus on the nape of the neck.

Owing to the thick scales the blister did not take, and it was repeated after cleaning the surface, and a good blister formed; a fresh acute attack was just threatening, but it did not come on, and the patient felt better. Three days later, the part having healed, the blister was repeated, and there was evident improvement after it; the scales were less, and the irritation was much relieved. The patient continued to improve, but, the rash threatening again, another blister was produced. This, however, did not stop the rash, which came out freely, but the itching was much less than usual, and the eruption lasted but a short time, and from that time he continued to improve and went out almost well, and was able to go to work for five months, but, having to keep his hands much in water, it then returned.

Encouraged by this result in a very unpromising case, he has extended this line of treatment, but using milder counter-irritants, such as mustard-plasters or mustard-leaves, instead of blisters, which are unnecessarily severe. Dr. Crocker reports several cases in which counter-irritation has been employed with the same results. The position of the counter-irritants should vary according to the region affected. Thus, for the face alone, it is placed behind the ears; for face and forearms, on the nape; about the genitals or legs, over the lumbar enlargement; and, if one leg only is affected, on the hip over the large sciatic nerve.

The result has been more or less beneficial in the great majority of cases. It has seldom failed to relieve the itching, and generally procured sleep, at least on the night of application, and often the alleviation has lasted for several nights. In many cases the redness and swelling have also subsided sometimes entirely, sometimes in great measure, and generally enough to make it more amenable to local treatment than it was before.

One advantage of this method is that it does not interfere in any way with other treatment, whether internal or external, and that it is safe; but, inasmuch as there is a natural shrinking from irritants on the part of an eczema patient, it may be more prudent in some cases to begin with dry heat, such as a hot tile wrapped in flannel, and, if sufficient relief is not obtained, to go on to stronger applications.

SUBIODIDE OF BISMUTH AS A SUBSTITUTE FOR IODOFORM.

It is generally conceded that iodoform stands in the front rank of antiseptics and as a surgical dressing for various diseased conditions. Its use is nevertheless attended by a number of serious drawbacks.

An article which Dr. Chassaignac (*New Orleans Medical and Surgical Journal*, July, 1887) believes to be a good substitute for iodoform is the subiodide of bismuth, which was used some ten years ago by Dr. A. S. Reynolds, who found it very efficacious, but was not generally adopted at the time on account of its high cost.

Subiodide of bismuth is of a bright brick-red color, impalpable when well powdered, almost odorless and tasteless, insoluble in water, alcohol, ether, or chloroform. It does not stain or impart its color to linen, and is easily washed out. It can be made by different processes, but we will only quote from the *American Journal of Pharmacy* one devised by Jos. W. England, Ph.G., and recommended by him, in an article on the subject, as "practicable in general employment."

℞ Bismuth. subnit., ℥iiss, gr. xxiv;
Nitric acid, f℥iii;
Hot water, f℥xii;
Potassium iodide, ℥xi, gr. iii;
Hot water, f℥xxviii.

Dissolve the bismuth salt in the acid in a porcelain capsule with the aid of heat, and add twelve fluidounces of boiling water in small portions at a time, stirring after each addition; then pour the bismuth solution in the hot water, in which has been dissolved the iodide, agitating it well after each addition. Continue agitating until decomposition is complete. Filter at once. Wash the precipitate with warm water. Dry and powder.

When subiodide of bismuth is dusted on a raw surface it produces over the latter a thin silvery film, somewhat analogous to that caused by lunar caustic when lightly applied, but much more faint. However, it imparts no stinging sensation, as this fact might suggest, but seems to have an anæsthetic effect similar to that of iodoform. It has a marked healing effect upon chancres, as well as chancroids. Dusted over wounds, whether accidental or made by the surgeon's knife, it acts as an antiseptic, diminishes the secretion of pus, and seems materially to hasten cicatriza-

tion. It is a good deodorant, for Dr. Chassaignac has applied it to chronic and foul ulcers of the leg, which, with ordinary application, required dressing daily or every other day, and with this could remain a week almost without being touched, and then be found without bad odor, having suppurated very little and granulated magnificently.

Its present price is now much less than iodoform, the latter selling at about five dollars a pound, while the subiodide of bismuth may be made so as to cost from three to three and a half dollars a pound.

A SIMPLE METHOD FOR ASSISTING DEGLUTITION IN ULCERATION OF THE EPIGLOTTIS.

One of the most distressing symptoms accompanying laryngeal phthisis with ulceration of the epiglottis is the difficulty patients experience in swallowing. Especially is this the case in advanced conditions where the epiglottis is more or less completely destroyed. In such circumstances the swallowing of even a teaspoonful of water, or liquid of any kind, is all but impossible, from the violent cough that is excited in consequence of the passage of some of the fluid into the larynx and trachea. Such patients are generally tormented with a thirst which they cannot satisfy, and the painful efforts they make to get down a few drops of liquid, and the terrible spasms of coughing and pain thereby produced, are truly pitiable to observe.

In the *Lancet* for July 2, 1887, Dr. R. Norris Wolfenden refers to a method of drinking large quantities of fluid with ease, even when the epiglottis has more than half disappeared from ulceration. The plan was suggested to him by a patient of his, who informed him that thinking of how boys are in the habit of drinking water from a running brook, by lying down upon the bank and putting the mouth to the water, determined him to adopt a similar position himself, and found by making use of a piece of india-rubber tubing that while lying stomach downwards, and with the feet higher than the rest of the body, and putting the piece of rubber tubing in the water, he was able to drink a large tumblerful without stopping and with the greatest ease and comfort, although in the ordinary position a teaspoonful of fluid was as much as he could manage to get down, and this was accomplished only at the cost of much pain and terrible paroxysms of coughing.

The plan is simple enough, and Dr. Wolfenden recommends it as an excellent method for alleviating one of the most distressing symptoms in patients suffering from such laryngeal conditions.

THE TREATMENT OF OBSTINATE CASES OF FLEXIONS OF THE UTERUS.

In a paper read before the British Gynæcological Society, Dr. C. H. S. Routh came to the following conclusions on the treatment of flexions (*Medical Press*, July 6, 1887):

1. Where ordinary Hodge pessaries are used,—(*a*) No pessaries whatever should be used, until such time as all inflammatory or congestive symptoms have been removed, and this is a *sine quâ non* in all cases when the fundus uteri is tender or inflamed. (*b*) Particular care should be taken to insure an exact fit of such pessary to the affected person to prevent pressure on the fundus or bent angle of the flexed uterus. It should be removed for cleansing purposes, etc., every three or four months for a few days, but again replaced,—kept in for a year. A shorter period could never, or very rarely, cure.

2. In regard to intra-uterine stems,—(*a*) Whenever the canal is narrowed or obstructed at the point of flexion, an intra-uterine stem is essential. In no case, however, should it be allowed to press against or even touch the fundus. (*b*) Where the flexion is not very marked, the india-rubber stem may be used. If the flexion be great, it is best to support it by a buckle pessary, and an internal stem again within it. In such cases, however, the solid diverging stem or buckle pessary are preferable. (*c*) If the adhesions which force the uterus in a flexed position be strong, the india-rubber steel spring intra-uterine stem should be first tried. If the adhesions be too strong, oöphorraphy affords the only chance of cure. (*d*) Intra-uterine stems, whether with or without buckle pessary, should be kept in for six or eight months. (*e*) In cases of great subinvolution of the uterus, the stem should be thicker than in ordinary cases, and especially so if the flexion be very marked. (*f*) Neither suspension of the uterus nor shortening of the round ligaments should be practised in cases of great uterine enlargements or prolapse. The same objections hold in cases of firm and extensive adhesions, and great debility and relaxation of the ligaments. (*g*) In all cases with marked prolapse the buckle pessary is the safest. (*h*) If, after full trial of instruments, they either fail or produce great pain and inflammation, then Dr. Alexander's

operation may be tried, and failing that, Dr. Heywood Smith's or Dr. Imlach's, except only in the exceptional cases before mentioned.

THE TREATMENT OF LUPUS BY INJECTIONS OF CORROSIVE SUBLIMATE.

Dr. Iginio Tansini, of Lodi (*Gazzeta degli Ospetali*, June 12), narrates the treatment of a case of lupus of the nose and face by means of repeated injections of corrosive sublimate. He began with a weak solution,—corrosive sublimate, 50 centigrammes; distilled water, 100 grammes. This produced no reaction of any kind. A stronger solution—corrosive sublimate, 1 gramme; distilled water, 100 grammes—was then used. This produced some tumefaction and œdema in the neighborhood of the punctures, and slight suppuration in some of them. Some fourteen or fifteen injections of a few drops were practised. Improvement soon became marked, and eventually all traces of the disease disappeared, the only marks left being those of the punctures in which suppuration had taken place. Dr. Tansini was led to try these injections by the following considerations: 1. That lupus is a form of tubercle. 2. That the bacilli are few, and have no tendency to diffuse themselves. 3. That corrosive sublimate has proved certainly destructive to bacilli. He claims advantages for this method on account of lessened pain and disturbance and superior cosmetic results. —*The Lancet*, July 9, 1887.

THE MANAGEMENT OF FÆCAL RETENTION UNCONNECTED WITH ORGANIC DISEASE.

The following is a summary of an elaborate paper by Dr. George Dalton Hays, published in the *New York Medical Journal* for May 21, 1887:

In acute constipation the best remedies are clysters, salines, and castor oil; in those forms denominated "bilious," lavage, emetics, and abstinence, and the use of cholagogues. Impaction of the colon results from causes of a chronic nature, but is apt to develop acute symptoms. Our chief reliance here rests upon intestinal irrigation. This should be employed in the manner indicated. In chronic constipation a thorough trial of all the hygienic and mechanical aids should precede the use of drugs, and, where recourse to the latter has eventually to be made, such aids are always to supplement all other forms of treatment. Medicines having a curative tendency should always be chosen in preference to those which merely relieve the symptoms. Enemata are also of great value here. Aloes, rhubarb, belladonna, strychnine, cascara, ipecac, physostigmine, ergot, and the occasional use of the salines are the most efficient remedies of this class. Various combinations and alternations of these produce effects not otherwise attainable, but it is essential to bear in mind that our remedies should be directed to the cause and not to its effect. In constipation of a chronic nature large fæcal accumulations may occur at any time, and no examination of a patient is complete which does not include a careful exploration of the colon through the abdominal walls.

CATHA EDULIS.

The use to which the leaves of *Catha edulis* are applied by the Arabs, and the accounts which have been given of their stimulating effects, naturally suggest the probability that they may resemble, in containing caffeine, the vegetable products that are used for similar purposes, such as coffee or tea, or, perhaps, have some resemblance to cocoa-leaves. A small quantity of the leaves of this plant, which are known in Arabia by the name of Gat or Kat, have been subjected to examination by Dr. B. H. Paul, who published his results in the *Pharmaceutical Journal and Transactions* for June 11, 1887.

On digesting the leaves with ether a very dark-colored tincture was obtained, of a deep bluish-green color by transmitted light when in a thin layer, and in larger masses brownish-red. By evaporating off the ether a very dark-green, waxy residue was left that was only partially soluble in alcohol. This appeared to consist chiefly of chlorophyll mixed with a waxy substance, and, after precipitating the chlorophyll from the alcoholic solution by lime, the filtrate gave no indications of the presence of caffeine.

The leaves, after having been treated with ether, were digested for some time with strong alcohol at a moderate heat, and on evaporating the clear tincture about ten per cent. of a dark-colored aromatic extract was obtained, for the most part soluble in water. The water-solution of it contained a considerable proportion of substance which formed a yellow precipitate with acetate of lead, and after that had been separated the clear liquor left, on evaporation, a brown, syrupy residue.

Treatment of this residue with chloroform failed to extract from it any caffeine, even after the addition of ammonia.

If the leaves had contained caffeine indications of its presence should have been obtained either in the ethereal or the alcoholic extract, and consequently it may be inferred that the leaves do not contain this substance. So far as he is able to judge from the results of his examination, Dr. Paul is disposed to think that the stimulating effects attributed to the leaves when chewed may be due to ethereal oil or some other aromatic and volatile constituent, but to determine this point a larger supply of the leaves would be required. One point to which reference may be made in a general way is the presence of a form of tannic acid in the leaves of *Catha edulis* closely analogous to that met with in tea, coffee, maté, and coca-leaves. It is, indeed, possible that the physiological action of these articles of food may be, in some measure, due to the astringent substances they contain, as well as to the presence of caffeine, theobromine, or cocaine; and, from this point of view, the further examination of those different analogues of tannic acid may be worth attention.

THE CAUSE AND TREATMENT OF FUNCTIONAL INSOMNIA.

At a recent meeting of the New York Neurological Society DR. B. SACHS (*New York Medical Journal*, May 21, 1887) read a paper on the above subject. Under the term he included cases of insomnia, pure and simple, occurring in persons of the neurasthenic habit. He preferred to say neurasthenic rather than hysterical, for in his experience actual insomnia was less frequent in truly hysterical patients than in those suffering from cerebral or spinal neurasthenia. A number of typical cases were cited. The author thought that in the majority of such cases there was good evidence of disturbances in the cerebral circulation. As it had been found in animals that an increased activity of the cerebral circulation was accompanied by a deficient circulation in the peripheral parts, so in many cases of chronic insomnia cold extremities, pallor of the skin, and a scanty uterine flow pointed to deficient peripheral circulation, and in many of these cases there was weakness of the heart, with a weak pulse. Special attention was called to the simultaneous occurrence of insomnia and headache, and to the fact that as a rule the headache was of the paralytic migraine type.

The treatment of migraine and that of insomnia were similar in many respects. The author wished particularly to insist on the point that continued hypnotic medication was worse than useless. The good results obtained by him had been due to close attention to matters of general regimen, to the treatment of anæmia, and to the strengthening of the force of the heart's action by cold douches, by the regulation of exercise, and by the methodical performance of definite forms of active physical exercise, such as riding, rowing, and mountain climbing. Hypnotics were of use only at the outset of treatment; among these the reader mentioned chloral and bromides, to be given at night, or bromides alone, amorphous hyoscyamine, urethan, and paraldehyde. Their use should be discontinued as soon as a slight improvement was noticeable, and from that time onward general treatment was to be pushed vigorously.

THE ANTAGONISM BETWEEN MORPHINE AND ATROPINE.

In the *Deutsches Archiv für Klinische Medicin*, 40 Band, 5 u. 6 Heft, LENHARTZ, of Leipzig, contributes an exhaustive paper upon this subject, which we summarize as follows:

He was led by the symptoms in three fatal cases of opium-poisoning to question whether the result was caused by morphine alone or by the combined effect of the atropine given as an antidote with the morphine. He has collected one hundred and thirty-two cases of opium-poisoning, of which fifty-nine were treated by some preparation of belladonna, generally atropine; of these seventeen died,—a mortality of 28.8 per cent. He also reports seventy-three cases which were treated without any preparation of belladonna, the treatment being generally stimulants, and the use of compresses and baths of cold water. Of these cases only eleven died,—a mortality of fifteen per cent. The injurious effect of atropine is most frequently exercised upon the heart, whose action is depressed by the opium-poisoning, and still more by its antidote. It is on this account that the author advises against the use of atropine as an antagonist to opium. His conclusions he has stated as follows:

The physiological antagonism between atropine and morphine is not established by a single authentic observation.

The use of atropine is not to be considered a means from which even an improvement in

the symptoms of opium-poisoning may be expected.

The principle of antidoting a poison by the use of another poison like atropine results in unreliable dosage, which has been productive of great injury.

The circumstance that cures have followed the use of atropine does not prove the positive value of the method.

The prognosis of opium-poisoning depends upon the use or neglect of a rational, non-antidosage system of treatment.

The careful comparison of the mortality of the two methods shows that the mortality after the treatment by stimulants and without atropine is less than that with other methods. An analysis of the cases from which these conclusions are drawn gives the following facts:

We have seen that of the first group of fifty-nine cases seventeen died,—28.8 per cent. Of the seventy-three cases of the second group, eleven, or fifteen per cent., died. Of the first seventeen cases eleven were from opium and six from morphine; of the second eleven, six died of opium and five of morphine. Among the first fifty-nine, five were children up to eleven and one-half years, and one of these died; of the seventy-three of the second group seventeen were children, and of these two died.

The doses which were poisonous varied as follows: A boy, 4 years old, died after taking 1 drachm of tinct. opii. A little child died after taking 2 teaspoonfuls of another opium preparation. With adults, from ⅓ to ½ grain of morphine, and 2 drachms of opium preparation, were the smallest fatal doses; while 6½ drachms of morphine and 10 drachms of laudanum were the largest poisonous doses taken. The pulse was accelerated in fifty-six cases, and in two-thirds of all cases was full, or moderately full; in twenty-five cases it was normal, or but little changed; in nineteen it was very weak. Respiration was twelve times quickened; in twenty-seven times it was stertorous; in twenty-two cases the breathing was much slower than normal; it was rarely normal. Spasm was observed in thirty-eight out of the one hundred and thirty-two cases. Convulsions,—trismus, opisthotonus, and general convulsions were observed in thirty cases,—22.7 per cent.,—and in twelve of the fatal cases. These convulsions occurred in twelve cases of morphine-poisoning, one of which was a child; they occurred in eighteen cases of opium-poisoning, of which four were children. Convulsive seizures of mild grade were observed in two cases of morphine-poisoning and six cases of opium-poisoning.

In eighty-six cases contracted pupils were observed, without reaction, in all 91.3 per cent.; dilated pupils were seen in six cases,—6.5 per cent.; the mydriasis was reported in three instances, several hours after the poisoning was diagnosticated!

From these observations he concludes that the condition of the pulse in opium-poisoning is one often changing; acceleration is most often present; less frequently weakness and irregularity. Respiration is generally retarded; changing respiration, somewhat accelerated, is not uncommon. Convulsions are more common than generally supposed; they generally occur among adults. The condition of the pupil agrees with the statement of Orfila, that in nineteen out of twenty cases contracted pupils were present.

In conclusion the author remarks regarding the experiments of Binz and Henbach, that the doses of opium which they gave to the dogs used in their experiments were not sufficient to bring the animals into as dangerous a condition as are human beings when they are poisoned. Atropine, as an antidote for such experiments, has not the effect which causes us to recommend its employment with the human subject. Moreover, the lessened arterial tension which these authors observed was not a source of danger for the animals; the cause of death being the convulsions, which resembled those caused by strychnine, and which caused the animal's death, in spite of the use of atropine.

A SIMPLE MODE OF PREPARING TAMPONS.

Dr. N. W. Cady, of Logansport, Ind., writes to the *New York Medical Record* for July 16, as follows: "Some time since I hit upon a handy method of preparing tampons. When made in the ordinary way, tampons are usually not firm enough, and the knots tied in the retaining string often produce pain, or even slight ulceration. The implement which I use in preparing them is a bit of wire twelve inches long, ending in a loop or hook. A piece of strong linen thread is doubled, and then looped over the hook, the ends being secured at the other end of the wire by two or three half-hitches. Cotton, oakum, jute, or wool is now wound firmly around the wire and thread until the roll is from four to five and one-half inches long, and from one-half to three-

fourths, or seven-eighths of an inch in diameter. The thread is now released from the wire loop, and the wire withdrawn, leaving the thread in the centre of the roll. The roll is then formed into a ring by tying the ends of the thread together firmly. Making the roll two and one-half inches or less, and correspondingly thicker, a conical tampon may be made. Oakum or jute answers very well for the interior of the roll, but I prefer cotton for the outside."

TINCTURE OF SIEGESBECKIA ORIENTALIS IN RINGWORM.

Of the drugs now generally prescribed in the treatment of tinea in its several varieties, some are exhibited in the form of ointments, and ointments are always more or less disagreeable to use; others free from greasy annoyances give the patient more or less pain in the application. In the *British Medical Journal* for June 25, 1887, Dr. J. Hutchison refers to a preparation which he has been using for some time, and which is devoid of both these drawbacks, and is at the same time a speedy and reliable means of curing the disease.

Dr. Hutchison has used it in fifteen cases of ringworm; of these, eight were cases of tinea circinata, four of tinea sycosis, two of tinea tonsurans, and one of tinea versicolor. The site of the eight cases of tinea circinata was in six of them upon the neck, and in two upon the calf of the leg. None of the patients called upon me till the disease was well developed, when the red, raised, circular, bounding edge, and the pale central area with its branny desquamation, left little doubt of the diagnosis. The four patients who were afflicted with tinea sycosis all blamed a "foul shave" for their ailment. In all of them the disease was upon the chin, and presented the characteristic fig-like appearance. The two cases of tinea tonsurans showed the roundness of the diseased patches, the scaly eruption, and the brittleness of the hairs peculiar to that form of the trouble. The one case of tinea versicolor was also typical.

His prescription in all of them was the same, namely, equal parts of tincture of siegesbeckia and glycerin, and this he ordered to be well rubbed into the affected area night and morning. The drug appears to act both as a stimulant and a parasiticide, and the method of cure was for the diseased patch to become broken up into a number of smaller patches, with sound skin intervening. These smaller patches became again broken up till they disappeared altogether, and in their place was left a red blush, as if the part had been struck a smart tap with a cane. This redness, however, only remained for a day or two. The two cases of tinea tonsurans were the most stubborn to give way, but even in their cases more frequent applications, and continuing the treatment over a longer period, brought about the result desired, and that, too, without resorting to epilation.

SOME OLD-TIME PRESCRIPTIONS.

In the *Medical and Surgical Reporter* for July 9, 1887, Dr. Harrison Allen calls attention to a number of classical prescriptions which seem to be in danger of being forgotten. The first of these was published in Dr. Chambers's lectures in London, 1865, and is as follows:

℞ Tincturæ ferri sesquichloridi, ʒii;
Strychninæ hydrochloratis, gr. ss;
Tincturæ digitalis, ʒi;
Misturæ camphor., ℥x.
Fiat mistura.
Sig.—Two tablespoonfuls twice daily.

Dr. Chambers states that he administered an ounce of the mixture twice a day, in a case of anæmia in which the eyeballs were prominent, and he dwells upon the significance of this form of anæmia seen in young women in whom there is excitement of the heart's action, retarded development of the sexual functions, and enlargement of the thyroid gland. This combination appears to act most happily in this condition. The iron is adapted to the anæmic condition, the strychnine is a tonic to the small blood-vessels and to the central nervous system, the digitalis is a heart-tonic, and the camphor is an antispasmodic. The remedy does not interfere with digestion. With watchfulness and care its use can be persisted in indefinitely. It is not necessary that all the symptoms included in the above category should be present in order that this remedy may prove efficacious. The recognition of a retarded state of development of the ovaries and associated organs, absence of the secondary sexual characters, anæmia, and a thyroid engorgement are sufficient.

A second formula, perhaps not as elegant as the foregoing, is the following:

℞ Hydrarg. bichlor., gr. iv;
Solve in spirit. rectif., ℥ii;
Decot. cinchonæ, ℥ii;
Mel rosæ,
Tinct. myrrhæ, aa ℥ii. M.
Et ft. gargarisma.

This prescription appears in the Institute of Surgery of Sir Charles Bell, and it would seem difficult to improve upon this formula for a mercurial wash for the ulcerated forms of syphilitic sore throat.

In prescribing it the patient should be directed to use a small quantity at a time, and to note its effects. If it prove to be too severe, he should add an equal quantity of water to each dose, which might be limited to a tablespoonful. If this prove to be irritating, it may be again diluted, until at last it can be easily borne. The patient should be encouraged to use the remedy as far as practicable in the form above given. If he is compelled to begin with the dilutions, he can be induced, after he is in a measure accustomed to the effects, gradually to return to the original strength of the remedy.

In employing an astringent for a gargle an admirable method employed by our seniors was, instead of using pure tannic acid, to introduce a native astringent substance known to contain the acid. As an example of this form, Dr. Allen gives a prescription known in Philadelphia as "Goddard's Gargle," as first introduced by Dr. Paul B. Goddard, and frequently prescribed by the late Dr. Francis Gurney Smith. It is as follows:

℞ Aluminis, ʒii;
Cort. granati, ℥ss;
Petal rosæ rub., ʒi;
Mellis, ℥i;
Aquæ bull., ℥vi. M.

The mixture can be used without dilution, or with an equal quantity of water. It appears to present all the features required by an astringent wash to the throat. If increased strength is demanded it is better to direct an agent to be employed topically by the attending physician.

Another preparation, the uses of which can be made to subserve a great number of indications, is Fowler's solution of arsenic. Small doses of this preparation, say 2 or 3 drops twice a day for a period varying from one to six months, produce most gratifying results in those states of impaired health which appear to be due to an inheritance of a phase of malnutrition, and which is so evasive that it is difficult to give it a distinctive name. Local diseases engrafted on such a condition will often resist remedies until arsenic, in the form of liquor potassæ arsenitis, is employed. Pharyngitis sicca, atrophic nasal catarrh, anæmia accompanying tertiary syphilis, are sometimes greatly improved, indeed to a degree far greater than it has been possible with any other agents, by these small doses of Fowler's solution.

HYDROSTATIC PRESSURE IN INVERSION OF THE UTERUS.

Professor Max Runge, of Dorpat, having a case of inversion of the uterus, caused by a midwife pulling on the cord, which had been allowed to remain without medical advice for nine weeks, made several fruitless endeavors to effect reduction by manipulation and by distention of the vagina, by means of Braun's colpeurynter, which consists merely of an india-rubber ball with thin walls, provided, like Barnes's bags, with a tube and stop-cock. He then bethought himself of a plan recommended and practised successfully by Krukenberg,—viz., the application of considerable hydrostatic pressure to the vaginal canal, with the view of dilating the os uteri and of softening the inverted uterus itself. Professor Max Runge sprinkled the colpeurynter well with iodoform, and again introduced it, connecting it with a vessel of water hung at the height of about three feet eight inches above the bed. Communication between the colpeurynter and the water-vessel was kept open, the stop-cock not being turned off, and so a high degree of hydrostatic pressure was continually exerted, distending the vagina and the os and compressing the body of the uterus. Next morning the pain caused by the apparatus became unendurable, and the patient pulled it away from her. Upon examination, it was found that the fundus had retreated within the os, which was widely distended; there was still, however, a partial inversion, which was readily reduced with the finger. The uterine cavity was then washed out with a carbolic solution, and a tampon of iodoform wool introduced into it. The mucous membrane of the vagina showing signs of sloughing, it was well powdered with iodoform; ergot was also given. The parts were carefully dressed for some days, and the patient made a rapid recovery.—*The Lancet*, June 25, 1887.

A NEW THEORY OF RESPIRATION.

According to the Vienna correspondent of the *New York Medical Journal*, July 9, 1887, at a recent meeting of the Imperial-Royal Society of Physicians, PROFESSOR VON FLESCHL propounded a new theory of respiration, of which the following are the chief features. He had sought to ascertain the utility of the heart-beat. It would be most unreasonable, he said, to have such a motor force as that of the heart simply to drive the blood mechanically into the vascular system,—that work could be much better done by a gradually increasing *vis a tergo*, and the heart-beat was dangerous to life by the consequent variations in the blood-pressure. Why did so many persons die of apoplexy? Because of the great oscillations of the blood-pressure caused by the action of the heart. The heart-beat must, therefore, have another purpose than the merely mechanical act of keeping up the circulation. Referring to the familiar fact of the sudden setting free of chemical constituents as the effect of concussion, the speaker remarked that he had shown on a previous occasion that it was the beat of the heart that set carbonic acid free in the right ventricle. Now, oxyhæmoglobin was of such a stable constitution that the affinity of the tissues for oxygen was too feeble to enable them to withdraw it from the combination. But the blood, charged with oxyhæmoglobin, was subjected to energetic agitation in the left ventricle, and the oxygen was set free in the same way that carbonic acid was set free by the action of the right ventricle; the blood of the left ventricle no longer contained oxyhæmoglobin, but free oxygen. In the first volume of his "Archiv" Pflüger had discussed the mechanical influence to which the blood was subjected in the heart, and had described the agitation which it sustained there, but he had not emphasized this phase of it, and had considered the change of surface as the chief feature. The speaker remarked that it would be a mistake to suppose that the blood that came out by the aorta was the same that had been carried to the heart by the pulmonary veins. Both the hæmoglobin and the tissues had a certain affinity for oxygen, and the purpose of the heart-beat was to settle the matter in favor of the tissues. To sustain his theory, the speaker mentioned the following facts: The oxygen could not be set free from a solution of oxyhæmoglobin, at a temperature of from 0° to 10° Celsius, unless the solution was shaken energetically; agitation with a spoon was not sufficient, but it must be subjected to repeated and decided shocks. Pflüger had known this fact, but he had not given it the correct interpretation. Approximately, one-third of the whole weight of the liver consisted of blood, the rest being parenchyma. Why, with the organ inundated with blood to this extent, was the hepatic artery so small in comparison with the size of the portal vein? Why did the tissue of the liver become necrosed when the hepatic artery was tied? These matters were explained by the speaker's theory. The blood of the hepatic artery contained free oxygen, whereas the oxygen of the blood of the portal vein, although it surpassed the other many times in quantity, was so combined with hæmoglobin that it could be of no use to the liver. It was known from the experiments of Claude Bernard, Stricker, and Albert that the blood of the left ventricle was cooler than that of the right ventricle by some tenths of a degree. This had been explained by the suggestion that the blood circulating through the lungs lost a part of its heat by evaporation and by contact with the inspired air. Heidenhain, however, had shown that this theory was not correct. He had caused animals to inhale air that had previously been heated and supersaturated with aqueous vapor, but nevertheless there was a difference in the temperature of the blood in the two ventricles. The speaker's theory gave the key to the true explanation. It was known that heat was evolved in every instance of oxygenation. In the lungs the blood still held its third part of oxygen in combination, and it was for this reason that it was warmer than the blood of the right ventricle. As to the left ventricle, cooling was due to the freeing of oxygen from its combination. In the aorta no considerable reoxygenation took place, for the blood coursing through that vessel still felt the force of the cardiac agitation, and it was interesting to note that the blood there was still cooler, by two-tenths of a degree, than that of the left ventricle. The speaker illustrated his theory with several further facts, and said that he would give the full details in a work to be published in October.

HOW TO GIVE INJECTIONS OF ERGOTINE.

In the *Centralblatt für Gynäkologie*, No. 28, 1887, BUMM describes the technique of injecting ergotine, which we condense, as follows:

Regarding the choice of a location for the injection, the writer is strongly opposed to the integument of the abdomen, which is so often chosen. He considers it an entirely

improper selection, and expresses his strong preference for the nates, where experience has shown that mercurials can be most conveniently injected. The solution must be injected directly into the muscles, and to accomplish this the needle should be introduced perpendicularly to the skin, and as deeply as its length will allow. Intramuscular injections are entirely absorbed twelve hours after injection, while subcutaneous injections are retained much longer. The choice of a proper solution is important. The fluid should be perfectly clear and liquid. It has been found that the greater part of the burning pain, of which patients often complain after these injections, is caused by the strongly acid reaction of the extract of ergot used. When this acidity is neutralized the virtue of the drug is unfortunately much impaired. A good preparation for injection should remain clear when almost neutralized by soda solution, not when the reaction is made alkaline. From his observations upon patients the writer concludes that the effect of the drug is not lessened by making the solution neutral. A second cause of the pain produced by injections is the strength of the solutions employed. A solution, 1 part of ergotine to 5 of water, is often recommended. The writer believes that solutions of five or ten per cent. are of more utility, and that in emergencies, when prompt action is demanded, two or three simultaneous injections of weaker solutions are better. The further advantage obtains that a dilute solution, distributed over a wider area, will be absorbed much more readily than a more concentrated solution retained in a smaller space. When a watery solution of from five to ten per cent. of a pure specimen of ergot is neutralized by soda, filtered until clear, and injected deeply into the nates, almost no after-effects are produced. A very trifling sensitiveness for a half or a whole day, with a little redness and swelling, is the most observed. The advantages of the nates over the skin of the abdomen as a place of injection are so great that the writer is positive in his recommendation.

USEFUL APPLICATIONS FOR INSECT-BITES.

BERNBECK has written a laborious essay upon this frequent and often insignificant ill, and proposes the following as the best applications which are known to him:

Elastic collodion, 10 parts;
Salicylic acid, 1 part.

Also

Elastic collodion, 1000 parts;
Bichlorid. hydrarg., 1 part.

To be used as soon as possible after a bite.

—*Pharmaceutische Post*, July 10, 1887.

THE PHYSIOLOGICAL EFFECTS OF COCAINE.

The above is the title of an elaborate paper by Mosso, of Turin, published in the *Archiv für Experimentelle Pathologie und Pharmacologie*, Band 23, Heft 3 u. 4, which we abstract as follows:

His first experiments were made with frogs, to test the effect of the drug upon the nervous system of cold-blooded animals. He found that in large doses cocaine paralyzed the spinal cord, while the motor and sensory nerves, in their peripheral portions, were yet intact. The conducting power of the cord was in abeyance, and the reflexes, as well as the other functions of the nerve cells of the cord, were for the time abolished. Only in the last stages of poisoning by cocaine was increased irritability of the motor nerves observed. The lymphatic heart of the frog was of course paralyzed by the paralysis of the spinal cord. Regarding the general effect of cocaine upon warm-blooded animals, he observed that animals of the same kind differed greatly in their power to bear large doses of the drug. He found that in its effect upon the general nervous system the convulsions which it caused were not exaggerated reflexes, because they did not depend upon external causes. They originated in the nerve-centres from a temporary malnutrition, and spread through the muscles. It did not produce convulsions in cold-blooded animals. Death sometimes took place, with the symptoms of tetanus; at other times, with a general paralysis, without especial convulsions. When the spinal cord was severed it was found that the cord alone, without the aid of the brain or the medulla, could excite strong convulsions of the muscles of the extremities, which exactly resembled the convulsions which cocaine produced in animals. The increased excitability of the cord was also attended by a rise in temperature. It was found that cocaine increased the frequency of respiration, and this was due, not to increased carbonic acid gas in the blood and the need for oxygen, but by a purely nervous stimulation which the drug exercised upon the nervous centres. The insuffla-

tion of cocaine in powder into the lungs resulted in an increased frequency in breathing also, and the conclusion was reached that cocaine is a direct respiratory stimulant. In small doses cocaine stimulated and accelerated the action of the frog's heart, and this effect persisted for some time after the blood containing the drug had left the heart. In large doses the heart was arrested in systole. The frequency of the heart's action in warm-blooded animals was not affected by small doses of cocaine; moderate doses produced a great acceleration, which sometimes became as high as three times the normal rate. In cocaine spasms the heart-beat was of course modified by the spasm. Regarding the effect of cocaine upon the pneumogastric nerve, it was found that not only the frequency but the vigor of the heart's contraction was altered. The increased frequence of the heart-beat was not caused by paralysis of the pneumogastric, for the nerve was found sensitive to the electric current after the use of very large amounts of cocaine. The drug lessens the susceptibility of the pneumogastric to electricity, but this effect does not persist, and disappears after even large doses if they are not renewed. The pneumogastric nerve does not lose its irritability, as shown by the fact that, after large doses have been given, the use of electricity on the nerve will influence respiration in its characteristic manner. Large doses of cocaine do not slow the heart's action. In its effect upon blood-pressure, doses of from $\frac{1}{6}$ to $\frac{1}{3}$ of a grain for each two pounds of body-weight increased blood-pressure in dogs; larger doses resulted in a lessening of blood-pressure. Great individual idiosyncrasies were observed. Cocaine retarded the fall in blood-pressure and lowering in body-heat, which usually follows severance of the spinal cord. In very large doses cocaine at first produced a lessening of blood-pressure; afterwards an increase. Cocaine was found to have a direct influence upon the blood-vessels. Experiments upon the circulation in extirpated organs of the body showed that in small doses, for example, $\frac{2}{1000}$ per cent. of body-weight, it produced no marked effect upon the blood-vessels. Doses of $\frac{4}{1000}$ per cent., $\frac{8}{1000}$ per cent., and $\frac{1}{100}$ per cent. produced a well-marked paralysis of the blood-vessels of the extirpated organs. Upon the function of respiration it was found that cocaine, whether introduced into the lungs or the veins of an animal, produced a preliminary lessening in the frequency of breathing, followed by a persistent and characteristic increase in the movements of respiration. Large doses produced a temporary paralysis, at times of the thorax, at times of the diaphragm. When the most intense and poisonous working of the drug is obtained, respiration is paralyzed. When the rectal temperature was above 106° F., increased respiration was observed as the precursor of respiratory paralysis and death. Artificial respiration is the best remedy for the respiratory paralysis of cocaine, as the heart continues to beat for some time after respiration ceases. Cocaine is of all known substances the most speedy and powerful increaser of bodily temperature. This increased temperature is not lessened by cutting the spinal cord. In determining the therapeutic uses and value of cocaine, experiments were made upon dogs whose skulls had been trephined and whose brains had been injured, and from these and other modes of research it was found that *cocaine was the best of all known excitants*, and this was confirmed by observations upon animals all of whose functions were rapidly failing. The most perfect antagonism was found to exist between chloral and cocaine, with the exception that the depression of temperature produced by chloral is not overcome by cocaine. An animal poisoned by chloral may be restored to consciousness and motion by cocaine, but no increase in the reduced body temperature occurs. The proportionate antagonism may be said to be $\frac{3}{8}$ of a grain of cocaine to each three pounds of body-weight, and 23 grains of chloral to each three pounds of body-weight. In attempting to antagonize the two drugs it must be remembered that in large doses both drugs paralyze respiration. The momentary paralysis of respiration produced by cocaine may be treated by artificial respiration. Fatal doses of chloral are endured when cocaine is first given. Chloroform and ether are direct antagonists by virtue of their subduing spasm and lowering temperature. When a patient is poisoned by cocaine and convulsions occur, with respiratory spasms, chloroform or ether may be given until the danger of spasm is passed, and chloral then used. The experimenter concludes that cocaine is of especial value in all narcotic poisoning by chloral, opium, morphine, and laudanum, where depression of the cardiac and respiratory centres exists. Also in chronic depressant poisonings from the bromides, or in spinal paralyses, the drug is indicated. It has all the advantages, without the poisonous nature, of strychnine.

VESICAL INJECTIONS OF IODOFORMIZED ETHER IN REBELLIOUS CASES OF CYSTITIS.

In the *Lyon Mèdical*, June 5, 1887, M. A. CHANDELEUX reports some results obtained by him in the treatment of rebellious cases of cystitis by means of injections of a nearly saturated solution of iodoform in ether, or thirteen parts of iodoform to one hundred parts of ether. He thinks the choice of liquid a matter of considerable importance.

His first case so treated was a patient æt. 32, affected for eight months with a very painful tuberculous cystitis, giving rise to efforts at micturition every half-hour, and accompanied from time to time with a slight hæmaturia.

He first saw the patient in September, 1884. After having tried repeatedly instillations of nitrate of silver according to the method of Guyon (a measure which is generally successful in tuberculous cystitis), and without any other advantage than a slight diminution of the daily number of micturitions and a very slight modification of the pains, he determined to inject a small quantity of iodoformized ether. October 2 he injected 2 grammes (half a drachm) of the solution. Immediately the patient experienced atrocious pain, and for a half-hour he cried and complained. But quiet followed. During that day and the succeeding one the acts of micturition were a little more numerous than before the injection; but the following days they diminished in frequency, and five days afterwards there were not more than thirty or thirty-five in the twenty-four hours. The injections were repeated four times at intervals of five days, gradually increasing the amount until the last was 4 grammes (1 drachm). Each time the pain caused was less severe, the micturitions became less numerous, and finally decreased to ten in twenty-four hours, and without any uncomfortable accompanying sensation. The blood had entirely disappeared from the urine. Six months later the improvement was maintained.

In four other patients he had made use of this treatment. Only one of them had a cystitis of tuberculous origin, and in him also the instillations of nitrate of silver had had no appreciable results, for micturition continued to be painful, frequent (thirty to thirty-five times in twenty-four hours), and slightly sanguinolent at the moment of emission of the last drops of urine. The treatment was the same as in the preceding case, and the results were even more satisfactory.

An interesting phenomenon observed in this case was the distention of the bladder by the vaporization of the ether from the heat of the body.

The other cases submitted to this treatment were suffering, not from tuberculous cystitis, but from chronic cystitis of three, seven, and ten years' standing respectively, due in the first to gonorrhœal inflammation and in the two others to rheumatism.

These patients urinated from seventy to ninety-six times in twenty-four hours. The urine was lightly clouded, and contained a little muco-pus. A drop of blood was generally expelled after each act of micturition.

Nitrate of silver instillations led to some amelioration of the suffering, and reduced the number of micturitions to fifty in twenty-four hours, but could not carry the benefit any further. Then the injections of iodoformized ether were resorted to, as in the other cases. The pains, as in them, were severe at first, but progressively diminished, and one of these patients at the sixth injection was able to bear 6 grammes (1½ drachms) of the solution for twenty-two minutes. This patient was so far cured that he was obliged to urinate not more than twelve to fourteen times in twenty-four hours, instead of once every fifteen minutes, as at first.

The others urinate only eight times a day, and all are relieved of their pain in micturition.

The professor is disposed to regard the distention of the bladder by the ether vapor as being perhaps the most important element in the curative action thus described.—*St. Louis Courier of Medicine*, September, 1887.

A PHYSIOLOGICAL BASIS FOR AN IMPROVED CARDIAC PATHOLOGY.

The following is an abstract of a paper read by DR. T. WESLEY MILLS before the Canadian Medical Association at its recent meeting at Hamilton (*Canadian Practitioner*, September, 1887).

1. The views presented in this paper are such as grow mainly out of the writer's own and other recent investigations in cardiac physiology, and seem to be in harmony with the facts of clinical medicine and pathology. The principal thesis presented for the first time, and maintained in this paper, is to this effect: The nerve-centres are generators and reservoirs of nerve-force, which force is not only exerted through nerves during the func-

tional action, so called, of an organ or tissue, but is *constantly* being distributed to all the tissues of the body, according to their nutritive requirements. The functional action of a tissue is but a phase in its normal life; one of a cycle of changes essential to the well-being of that tissue, and without which its continued integrity is impossible. This view renders clearer the main part of the theory, which is that there is a *constant* outflow of nervous energy to the tissues, and not alone during the functional activity. It follows that functional use and the *highest* nutritive condition of a tissue are inseparable; but this view also explains why tissues do not perish outright, when not for some time functionally active, provided the centres presiding over them and the nerves distributed to them are intact; while they do generate in every instance when their nerves are divided. This explanation the writer would denominate the *neuro-trophic* theory, or better, the theory of *constant neurotrophic influence*. The evidence for this view is based upon common experience as to loss of appetite under depressing emotions; the results of functional and other disorders of the nerve-centres; the sequel of the section of the nerves of glands, muscle, etc. An explanation of the injurious effects on the heart of sexual excesses is given in the light of this theory. Athletic strain is intelligible only on some such view as this. We must recognize in man a *residual nerve-force*, exhaustion of which is followed by lasting injury. *Heart-failure falls under one general law for all the tissues.* The explanations hitherto given generally do not go beyond the remote cause (occasion). An explanation that is only mechanical can never be final for a living organism.

Certain peculiarities in cardiac disease are rendered much more intelligible when the *order of evolution* of the different parts of the heart in the animal series is considered. The oldest parts of the heart ancestrally considered have the greatest vitality.

It is also especially important both in etiology and treatment to remember the disproportionate development of the cerebrum in man.

2. The nerves of the heart now appear in a new light owing to recent researches. Influences from the nerve-centres reach the heart either by *sympathetic* nerve-fibres or *inhibitory* fibres proper. The vagus is really a *vago-sympathetic* nerve in all vertebrates thus far examined. The cardiac accelerators contain purely sympathetic fibres. The sympathetic fibres that reach the heart, in whatever nerves found, tend to bring about destructive nutritive changes (catabolic metabolism), and so to exhaust the heart; while the inhibitory fibres affect constructive nutritive changes (anabolic metabolism).

The nerves of the heart exercise a *constant* influence over its nutrition. Section of these nerves leads to degenerative tissue-changes.

The views presented in this paper are not opposed to facts, while they furnish explanations that are both real and final.

BIBORATE OF AMMONIUM IN URIC ACID CALCULI.

The treatment of a paroxysm of renal colic is sufficiently plain, but the prevention of this paroxysm is a matter which has puzzled the master-minds of the medical profession from time immemorial. Dr. William J. Crittenden states in the *Virginia Medical Monthly* for June, 1887, that he finds biborate of ammonium to be a drug possessing peculiar influence over uric acid calculi. In patients attacked with renal colic, caused by uric acid calculi, Dr. Crittenden prescribes 20-grain doses of biborate of ammonium every two hours until a free passage of urine takes place, and then every four hours until all ill feeling passes away. He then decreases the dose to 15 grains, three times a day, before meals, in a glass of flaxseed-tea, and continues this treatment for several months, discontinuing it for a day or two at a time every two weeks. When given for a length of time, he states that he has found it to be a good plan to combine it with lithiated extract of hydrangea in teaspoonful doses.

THE PHYSIOLOGICAL AND THERAPEUTICAL EFFECT OF HELLEBORUS VIRIDIS UPON THE HEART AND THE CIRCULATION OF THE BLOOD.

Helleborus viridis, of the family of the Ranunculæ, has been long known in medicine. In olden times many different species of hellebore were used as purgatives and emetics,—*H. viridis*, *orientalis*, *niger*, etc.

Prof. Schroff lays great stress upon the benefit obtained by the energetic action of the radix hellebori viridis upon the heart.

Further, Drs. Husemann and Marmé have extracted from the roots of different kinds of hellebore two glucosides,—helleborein and helleborin. The former, which is soluble in

water, in their opinion is analogous to digitalis; the latter, however, which is easily dissolved in alcohol and not in water, is a narcotic.

From the proposition of Prof. S. P. Botkin, DR. N. ISCHISTOWITCH (*Centralb. f. d. Med. Wissen.*, July 9, 1887) experimented upon the effect of the radix hellebori viridis upon the heart and the circulation of the blood, using a liquid watery extract (extractum fluidum aquosum radicis hellebori viridis).

The principal results of his experiments upon frogs are as follows:

1. By subcutaneous injections of 0.1 to 0.6 c.c. 1 proc. of the watery solution of the extr. fluid. rad. hellebori vir. one noticed diminution of the number of heart contractions; the contractions were fewer but more energetic.

Later, the ventricle during the dilatation begins to weaken, but not altogether, the contractions partake of a vermiform character, and at last the ventricle is brought to a stand-still in a strongly-contracted condition; the exterior chambers are filled full of blood, contract, however, after a time, gradually decrease, and finally cease altogether. Before the entire cessation of the ventricle one contraction of the same will be two contractions of the outer chamber.

2. The changes in the action of the heart, described above, are observed by the previous severing of the sympathetico-vagus nerve and the injection of atropine. The observation of the diminution of the heart contractions was also made upon an excised heart with the assistance of the Williams apparatus for supplying the heart.

3. The excitability of the muscles of the heart increases at first and for a considerable time, after which the decrease begins.

This conclusion is supported by experiments made with the assistance of the Williams apparatus upon the point of the heart ventricle of an extracted heart.

The contractions of the point of the heart were periodically aroused by induction currents at definite intervals.

The minimum strength of the current was decided by the contraction of the point at each induction of the current.

4. The sympathetico-vagi possess the power to reserve the cessation of the heart until the entire cessation of the ventricle, after which irritation of the vagi prevents the contraction of the outer chambers.

To restore the heart to its normal, after using the remedy under discussion, an irritation of less strength is necessary than before the injection.

5. The blood-pressure in the arteries of the frog is increased through the extr. fluid. rad. hellebori vir.

This pressure is caused by the contraction of the smaller vessels (experiments of artificial blood circulation by the method of Prof. Setschenoff), and by the increase of the working power of the heart (experiments by the Williams apparatus).

The following results were obtained by experiments upon dogs:

1. Injections of from 0.1 to 1.5 c.c. per kilogramme of the weight of the body, of the watery solution of extr. fluid. rad. hellebori vir., cause the diminution of the beat of the pulse, and single heart contractions grow stronger; the pressure of blood in the arteries is increased, also later begins an increase in the heart-beats and also a further increase in the pressure of blood.

After this the pressure decreases a little, the pulse becomes fluttering at times, which causes the heart to contract irregularly and suddenly to stop altogether.

2. The lessening of the beat of the pulse, which is characteristic of the first period of the effect of the medicine, can be prevented by the severing of the Nn. vagi or through injections of atropine.

3. The increase in the arterial blood-pressure is caused on one side by the contraction of the vessels of the body in consequence of the effect of our medicine upon the peripheric nervo-muscular apparatus of the vessels. (This has been proved by experiments in artificial blood circulation in amputated extremities.) But, on the other side, the increase in the pressure in the arteries during the increase of the strength of the heart contractions is dependent upon the increase of the action of the heart. This last I have proved with the assistance of Dr. G. Pawlow in experiments upon extracted hearts, with the exception of the greater and lesser circulation of the blood. (A description of this method will shortly appear in the *Centralblatt für Physiologie.*)

4. Experiments on artificial blood circulation through the cells of extirpated lungs prove that the action of our remedy causes the vessels of the lungs to contract.

5. The peripheric, as also the central vasodilator nerves, retain, after the poisoning by extr. fluid. rad. hellebori vir., their functional ability.

Clinical observations were made upon eleven cases of different heart-diseases at the period of a beginning failure of compensation.

The doses were from 10 to 20 drops of a one per cent. watery solution four or six times daily, or a teaspoonful of the infusion every two hours.

In six cases after use of the medicine there was strengthening of the pulse, lessening of the frequence of the pulse, and increased secretion of urine. All appearance of the failure of compensation disappeared rapidly, and the transudation was rapidly absorbed.

In two cases extr. fluid. rad. hellebori vir. and infusum adonid. vernalis given separately were without effect, but given together the condition of the patients improved rapidly.

In three cases our remedy gave negative results. In two of these cases the affection of the heart was accompanied by nephritis, and in the third case there was a complicated malformation of the heart, accompanied by pleuritic exsudativa.

DETAILS OF KOLISHER'S TREATMENT FOR TUBERCULOSIS.

We add to the account which we have already given of this method of treatment the following details as given in the *Centralblatt für die gesammte Therapie* for July, 1887: In cases where an opening has not yet been established the part is covered with a dressing of sublimate gauze for twenty-four hours, then thoroughly cleansed with soap and water, and finally with sublimate solution 1 to 1000. The injection is made with a Pravaz's syringe, having a platinum needle, which has been cleansed with a five per cent. solution of carbolic acid. The fluid is gradually injected until it thoroughly distends the tuberculous tissue, giving an elastic feeling on palpation; this is pushed until the tissue is tense, the portions not injected feeling less elastic and being depressed. The needle is inserted to its full length, and its passage into healthy tissue is marked by a sensation of resistance or grating; the tuberculous matter does not bleed as freely as does healthy tissue, and the latter is painful when injected in a greater degree than the diseased parts. The injections are painful, and morphia is frequently needed to quiet patients afterwards. These pains continue for several hours, and are often accompanied by fever of considerable severity, which persists for twelve or twenty-four hours. The part is at first covered with an antiseptic bandage, which is removed after five or six days, to be followed by a plaster-of-Paris bandage, which is removed as needed. When the stage of reaction and hardening has become fully established, which generally occurs in from three to six weeks, passive motion and massage are employed to restore motion. Contractions and subluxations are treated as they demand. When in a week after injection abscesses form and break, the opening is enlarged and the cavity tamponed with gauze soaked in phosphate solution; over the tampon is placed an antiseptic dressing. These tampons are generally removed once in two days, as a profuse discharge of foul matter ensues. When the cavity has filled with healthy granulations they are treated with nitrate of silver and iodoform, as is usual in surgery. Even in these cases careful after-treatment may secure motion. In cases of necrosis the same treatment is employed. Cold abscesses are laid open, scooped, and tamponed with calcium phosphate gauze, and the edges are often freshened and sutured after Kocher's method, which lessens the scar produced. When tubercular granulations have reached the surface of the body the point of exit is enlarged, the edges freshened, the cavity tamponed with gauze, and the cavity injected with the solution; if the granulations are very torpid the caustic solutions of calcium phosphate are employed. Two cases of well-marked tuberculous fistulæ were treated with good success. Tuberculous skin-ulcers were bandaged with gauze soaked in phosphate solutions, and healed rapidly. The number of tuberculous lymphomata treated was too small to admit of reaching any conclusion. FREUND has experimented with solutions of various substances for Kolischer's use, calcium chloride, calcium carbonate, and water charged with saline matter, giving no results. Solutions of acid calcium phosphate were then used, and after many experiments two solutions were united containing one and two per cent. of free phosphoric acid. The following solution is generally used for injection:

Calci. phosphor. neutral., 5 parts;
Aquæ dest., 50 parts;
Acid. phosph., q. s. ad solut. perfect.
Filtra, adde
Acid. phosphor. dil., $\frac{6}{10}$ part;
Aquæ dest., q. s. ad 100 parts.

The same solution is generally used for impregnating gauze. In especially torpid processes a double quantity of phosphoric acid is added, to the proportion of two per cent. The solutions used for injection are first sterilized.

AN IMPROVED CAUSTIC PASTE.

Dr. Jules Felix, of Brussels, having found existing caustics unsatisfactory from the great pain which is caused by their application, from the difficulty of limiting their action precisely to the part desired, from their deliquescence and from various other causes, has devised a form of caustic paste which he has been using for some time past with the best results. It does not cause severe pain or set up any general reaction; the eschar is hard and well defined, so as to be easily detached. It is also a powerful antiseptic and hæmostatic. It is not deliquescent, but keeps its consistence, which is that of putty, well, and so lends itself easily to manipulation. The hands should be wetted when applying it. They are not in any danger of being acted on. The paste is allowed to remain for from six to twenty-four hours according to the amount of eschar which it is desired to form. The formula for the paste is as follows: Mix in a mortar the following substances in powder: Starch, 37 grms.; wheat flour, 112 grms.; bichloride of mercury, 1 grm.; dry chloride of zinc, 110 grms.; iodol pure, 10 grms.; croton chloral, 10 grms.; bromide of camphor, 10 grms.; crystallized carbolic acid, 10 grms. Then add gradually a sufficient quantity of distilled water to form a homogeneous paste, without lumps, of the consistence of putty. This paste will keep an indefinite length of time.—*Lancet*, August 6, 1887.

ANTIPYRIN SUBCUTANEOUSLY IN PLACE OF MORPHINE.

Germain Sée has reported to the Academy of Sciences his observations in the use of antipyrin subcutaneously in place of morphine. The ready solubility of the drug in water makes this mode of its administration easy. 8 grains of antipyrin may be dissolved in an equal amount of distilled water, and given as one dose. A feeling of generally-increased tension follows, which is soon succeeded by a remission of pain, from whatever cause. None of the ill after-effects so often produced by morphine follow the administration of antipyrin. Neither somnolence nor excitability are produced by antipyrin, and it apparently possesses not only the power of checking pain, but of curing it. The diseases in whose treatment it may be employed are many. Excellent results were obtained by the writer in the treatment of acute articular rheumatism by two or three injections of 8 grains of antipyrin, aided by the further use of 45 grains taken daily for some time. Acutely painful gout, chronic gout, and rheumatism have been very favorably modified by this remedy. In neuralgias, lumbago, migraine, and tabes it has cured pain. One injection, and from 45 to 60 grains taken internally, were especially successful in tabes. In patients suffering from biliary calculi the drug gives the best results, without disturbing the intestinal functions. In this respect it is greatly superior to morphine, which deranges the secretions. In nephritic colic it is equally valuable, as it relieves the pain without deranging the secretion or voiding of urine. In painful affections of the heart and angina pectoris antipyrin gives the greatest relief; attacks of angina pectoris are diminished in number and violence by these injections. In asthma and severe dyspnœas of whatever origin antipyrin checked the paroxysm most promptly. It was used in these cases during the attack itself, when iodide of potassium had failed to break up the disease, and the patient had been accustomed to have recourse to morphine for relief. Antipyrin promotes and facilitates expectoration in asthma, without suppressing the bronchial secretions. So far, in the writer's experience, there is not a disease or complication where antipyrin cannot replace morphine in the cure of the pain produced by disease. The advantages to be gained by society in using a drug for which a habit will not readily be formed, as for morphine, are very great. Antipyrin diminishes the reflex excitability of the spinal cord, without producing the sensations of intoxication which morphine causes. —*La France Médicale*, No. 86, 1887.

BORATE OF AMMONIUM IN PHTHISIS.

Borate of ammonium has been found by Prof. Lashkevich of great value in phthisis. Internally, he gives 5 grains three times a day in solution, either alone or combined with codeia, hyoscyamus, or other sedatives. This he finds produces a marked effect on the expectoration, and in some cases where the affection had only reached an early stage a distinct diminution of the pyrexia was observed. The solution was also employed with advantage as an inhalation (in the form of spray ?), reducing the expectoration and alleviating irritating and painful conditions of the mouth and throat.—*Lancet*, August 6, 1887.

THE INTERNATIONAL MEDICAL CONGRESS.*

AN EXPERIMENTAL CONTRIBUTION TO INTESTINAL SURGERY, WITH SPECIAL REFERENCE TO THE TREATMENT OF INTESTINAL OBSTRUCTION.

THE following is an abstract of a paper read before the Section in General Surgery by DR. NICHOLAS SENN, of Milwaukee, Wis. :

1. ARTIFICIAL INTESTINAL OBSTRUCTION —STENOSIS.—(*a*) *Partial enterecotmy and longitudinal suturing of wound.*—Traumatic stenosis from this cause becomes a source of danger from obstruction or perforation in all cases where the lumen of the bowel is reduced more than one-half in size. Longitudinal suturing of wounds on the mesenteric side of the intestine should never be practised, as such a procedure is invariably followed by gangrene and perforation by intercepting the vascular supply to the portion of bowel which corresponds to the mesenteric defect.

(*b*) *Circular Constriction of Intestine.*—The immediate cause of gangrene in circular constriction of a loop of intestine is due to obstruction of the venous circulation, and takes place first at a point most remote from the cause of the obstruction.

2. FLEXION.—(*a*) *Flexion produced by Partial Enterectomy and Transverse Suture of Wound.*—On the convex surface of the bowel a defect an inch in width can be closed by transverse suturing without causing obstruction by flexion. In such cases the stenosis is subsequently corrected by a compensating bulging, or dilatation, of the mesenteric side of the bowel. Closing a wound of such dimensions on the mesenteric side of the bowel by transverse suturing may give rise to intestinal obstruction by flexion, and to gangrene and perforation by seriously impairing the arterial supply to, and venous return from, the portion of bowel corresponding with the mesenteric defect.

(*b*) *Flexion caused by Inflammatory and other Extrinsic Causes* gives rise to intestinal obstruction only in case the functional capacity of the flexed portion of the bowel has been diminished or suspended by the causes which have produced the flexion, or by subsequent causes independently of the flexion.

3. VOLVULUS.—As in flexion, a volvulus gives rise to symptoms of obstruction when the causes which have given rise to a rotation upon its axis of a loop of bowel have at the same time produced an impairment or suspension of peristalsis in the portion of bowel which constitutes the volvulus, or when a diminution or suspension of peristalsis follows in consequence of the rotation.

4. INVAGINATION.—Accumulation of intestinal contents above the seat of invagination is one of the most important factors which prevents spontaneous disinvagination, and which determines gangrene of the intussuscipiens.

Spontaneous reduction is not more frequent in ascending than descending invagination.

The immediate cause of gangrene of the intussuscipiens is obstruction to the return of venous blood by constriction at the neck of the intussuscipiens. Ileo-cæcal invagination, when recent, can frequently be reduced by distentions of the colon and rectum with water, but this method of reduction must be practised with great care and gentleness, as over-distention of the colon and rectum is productive of multiple longitudinal lacerations of the peritoneal coat, an accident which is followed by the gravest consequences.

The competency of the ileo-cæcal valve can only be overcome by over-distention of the cæcum, and is effected by a mechanical separation of the margins of the valve ; consequently it is imprudent to attempt treatment of intestinal obstruction beyond the ileo-cæcal valve by injections per rectum.

ENTERECTOMY.—Resection of more than six feet of the small intestine in dogs is uniformly fatal. The cause of death in such cases is always attributable to the immediate effects of the trauma. Resection of more than four feet of the small intestine in dogs is incompatible with normal digestion, absorption, and nutrition, and often results in death from marasmus.

In cases of extensive intestinal resection the remaining portion of the intestinal tract undergoes compensatory hypertrophy, which, macroscopically, is shown by thickening of the intestinal coats and increased vascularization.

PHYSIOLOGICAL EXCLUSION.—Physiological exclusion of an extensive portion of the intestinal tract does not impair digestion, absorption, and nutrition as seriously as the removal of a similar portion by resection.

Fecal accumulation does not take place in the excluded portion of the intestinal canal.

The excluded portion of the bowel undergoes progressive atrophy.

* The following abstracts of papers read before the different sections of the International Medical Congress are selected from the report furnished by the *New York Medical Record.*

CIRCULAR ENTERRORHAPHY.—A modification of Jobert's invagination-suture, by lining the intussusceptum with a thin, flexible rubber ring, and the substitution of catgut for silk sutures, is preferable to Czerny-Lembert sutures.

The line of suturing on neck of intussuscipiens should be covered by a flap or graft of omentum in all cases of circular resection, as this procedure furnishes an additional protection against perforation.

In circular enterorrhaphy, continuity of the peritoneal surface should be secured where the mesentery is detached by uniting the peritoneum with a fine catgut suture before the bowel is united, as this modification of the ordinary method furnishes better security against perforation on the mesenteric side.

INTESTINAL ANASTOMOSIS.

The formation of a fistulous communication between the bowel above and below the seat of obstruction should take the place of resection and circular enterorrhaphy in all cases where it is impossible or impracticable to remove the cause of obstruction, or where the pathological conditions which have given rise to the obstruction do not constitute an intrinsic source of danger. Gastro-enterostomy and jejuno-ileostomy should always be made by approximation with partially or completely decalcified perforated bone-plates.

In making an intestinal anastomosis for obstructions in the cæcum or colon, the communication above and below the seat of obstruction can be established by apposition with decalcified perforated bone-plates, or by lateral implantation of the ileum into the colon or rectum. An ileo-colostomy, or ileo-rectostomy, by approximation with decalcified perforated bone-plates or lateral implantation should be done in all cases of irreducible ileo-cæcal invaginations where the local signs do not indicate the existence, or occurrence, of gangrene and perforation. In all cases of threatened gangrene and perforation the invaginated portion should be excised, both ends of the bowel closed, and the continuity of the intestinal canal restored by making an ileo-colostomy by approximation with perforated decalcified bone-plates or by lateral implantation. The restoration of the continuity of the intestinal canal by perforated approximation-plates, or lateral implantation, should be resorted to in all cases where circular enterorrhaphy is impossible on account of the difference in the size of the lumina of the two ends of the bowel.

In cases of multiple gunshot wounds of the intestines involving the lateral or convex side of the bowel, the formation of intestinal anastomosis by perforated decalcified bone-plates should be preferred to suturing, as this procedure is equally, if not more, safe and requires less time.

ADHESION EXPERIMENTS.—Definitive healing of an intestinal wound is only completed after the formation of a net-work of new vessels in the product of tissue-proliferation from the approximated serous surfaces. Under favorable circumstances quite firm adhesions are formed between the peritoneal surfaces within six to twelve hours which effectually resist the pressure from within outward. Scarification of the peritoneum at the seat of approximation hastens the formation of adhesions and the definitive healing of intestinal wounds.

Omental grafts, from one to two inches in width, and sufficiently long to completely encircle the bowel, retain their vitality, become firmly adherent in from twelve to eighteen hours, and are freely supplied with blood-vessels in from twenty-four to forty-eight hours. Omental transplantation, or omental grafting, should be done in every circular resection, or suturing of large intestinal wounds, as this procedure favors the healing of the visceral wound and furnishes an additional protection against perforation.

The speaker presented some valuable specimens in which the operation had been performed on dogs; these specimens fully illustrated the value of the method advocated, and its entire feasibility, the union in some of these specimens being most remarkable. He called attention to its use in stenosis of the pyloric orifice. The duodenum or the first convenient coil of intestine being connected with the stomach by the method advocated, adhesions would form in from fourteen to twenty-four hours.

The adhesions in the specimen shown were wonderfully firm and strong.

ARTIFICIAL AND COMBINED DRAINAGE OF THE BLADDER, KIDNEYS, AND UTERUS THROUGH THE VAGINA, WITH AND WITHOUT GRADUATED PRESSURE.

In this paper, read before the Section in Gynæcology, DR. NATHAN BOZEMAN, of New York, described an instrument which he had devised recently. This draws the uterine away from the mucous membrane, and in the most perfect manner. He has also been able to combine in the same instrument drainage with the dilatation of the cicatricial tissue of

the vagina. The form of the instruments which concerns us here is intended for drainage alone, and he has called them intra-vaginal and vulvo-vaginal drainage-supports. The intra-vaginal instrument is applicable in most cases to all positions of the body. The vulvo-vaginal form is suited to the recumbent position, and to cases where the perineum is lacerated. These can be introduced and removed by the patient when necessary. They are small and simple, free from angles and sharp bodies, are readily kept clean, and excite no discomfort or irritation of the vagina. They do not press on the rectum or vagina, nor do they interfere with locomotion.

The author closed his paper with the following conclusions:

1. The importance of completion of the operation for fistula has not been duly appreciated. This forms, in many cases, the principal difficulty in the successful performance of the operation for the closure of the fistular opening. In other cases, when the fistula is cured, but the complications left without treatment, they lead sooner or later to the death or suffering of the patient. The greatest care should therefore be taken to discover and remove them.

2. Kolpokleisis, occlusion of the os uteri, and incision of the cervix in the bladder or rectum, are unjustifiable operations. They destroy the functions of the generative organs, lead to cystitis, then form venereal and vesicular calculi, pyelitis, and other diseases. Moreover, they are unnecessary. By means of the preparatory treatment of the complication by the aid of his button-suture and his dilating speculum, the author has been able to overcome all the difficulties which have been described as indications for operation.

3. The association of combined drainage in the dilatation of the vagina is a great improvement. The inconvenience and evil effects of incontinence of urine are thereby lessened, and the duration of the treatment shortened by the more rapid healing of the incisions and the formation of less cicatricial material in the reparative process.

4. We now propose a means of palliating the suffering due to incontinence of urine in a small proportion of cases of fistula which are incurable by this method,—even the dangerous one of kolpokleisis. Dr. Bozeman believes that some form of drainage may be instituted in every case, and the patient may be thus restored to enjoy life and the performance of its duties.

5. The possession of a system of combined drainage will widen the scope of the operation of kolpo-cystotomy, done for cystitis, by removing the evils of incontinence of urine, now the chief objection to its performance.

6. Finally, the operation which Dr. Bozeman calls kolpo-urethro-cystotomy, followed by the exploration and treatment of the disease of the ureters and pelvis of the kidney, appears to have a brilliant future before it. In the treatment of pyelitis, renal calculi, and obstruction of the ureters, it will restrict within narrow limits the operation of nephrotomy and nephrectomy.

THE USE OF THE VAGINAL TAMPON IN PELVIC INFLAMMATION.

Dr. W. W. Potter, of Buffalo, N. Y., read a paper with the above title before the Section in Gynæcology, of which the following is an abstract:

A married woman, 22 years of age, came under the author's care about a year ago, with a previous history of abortion, which happened eight months before, from which time her invalidism dated. Upon his first examination, early in June, he found great tenderness of the intra pelvic organs and tissues, with partial fixation of the womb. The left tube was enlarged, and presented a banana-shaped mass to the touch, while the surrounding cellular tissue was more or less hard and tense. This finally grew soft, and late in August pus was discharged through the uterus, after which the tube diminished in size. There was relief from pain, and the general health improved. The improvement continued until November, when the tube again grew tender and swollen; but another discharge of pus soon brought relief again. From this time onward the gain was uninterrupted, and she was dismissed cured on April 1, 1887.

The treatment consisted in the regular and systematic tamponnement of the vagina twice a week, copious vaginal lavements of hot water, frequently administered, and constitutional measures, principally of iron and arsenic. The vagina was insufflated just prior to each packing with iodoform, bismuth, mineral earth, or other powder, and then small pledgets of cotton, wool, or jute were introduced in sufficient numbers to make gentle, firm, and even pressure, as well as afford comfortable support. Though there was much more of detail, he said these were the essentials of the management, and their

continuous employment for a period of nine months brought recovery.

Reference was made to the advancement gained of late in the differentiation of pelvic diseases of women, whereby the domain of gynæcological therapeutics had been so enlarged that it was no longer possible to group all the ailments of woman under the inexact and misleading heads, "ulceration," "prolapsus," and "inflammation."

One of the important consequences of this more accurate classification of pelvic disease had been to invite surgical aid and interference in regions previously considered unsafe for the knife, and for maladies hitherto regarded incurable. The road to fame was so direct through the open gateway of a brilliant abdominal section that it was just possible that some ambitious men had removed an innocent ovary or unoffending tube, now and then, to obtain a "record" as spayers of women. He would not disparage the work of Battey, Tait, Hegar, Goodell, and others in this field, for he believed it of inestimable worth, nor would he deny that excision was often necessary; but, on the other hand, he thought the appendages might often be saved by timely and judicious management. The case reported, one of a number he had seen of a similar nature, was sufficiently typical to illustrate his purpose, and from which the following deductions might fairly be drawn:

1. That many cases of disease of the uterine appendages might be arrested in their progress and diverted to successful issue without operation by appropriate treatment resorted to in their earliest stages

2. That the early employment of regular, prolonged, and systematic vaginal tamponnement afforded one of the safest, surest, and simplest ways of preventing the ravages, in whole or in part, of the maladies in question, and of averting that mutilating of the sexuality of women consequent upon excision.

VAGINAL TAMPONNEMENT.

This occasion gave him the opportunity of offering some remarks upon the employment of vaginal tamponnement in the treatment of vaginal disease in general, a subject which was again creeping into medical literature through society discussions and papers.

In order to obtain the full benefits of this treatment, it was of the first importance that the packing be well done; that it be so placed as to afford ample support, give secure rest to the parts, make firm pressure, and not become dislodged during its wearing: while, at the same time, it must not produce discomfort, interfere with the functions of the pelvic organs, nor cause irritation in the least degree.

In giving instructions as to its use, he states the tampon must be multiple, and not made up of a single wad or mass, as was too often done.

For the past ten years he has made systematic use of the knee-chest posture in the reduction of pelvic visceral displacements and of the multiple tampon in that connection, while latterly he had also employed them in the treatment of pelvic inflammations, the whole comprising many hundred cases. As a result of this experience he had reached the following conclusions:

1. In retro-deviations of the uterus the reposition of the organ should be made in the genu-pectoral posture without the aid of any other repositor than the finger; it should then be shoved up and held in place by the multiple tampon. This treatment should always precede the employment of a pessary for a longer or shorter period, according to the peculiarities of the case.

2. The foregoing applies with equally cogent force to prolapses and inflammations of the ovaries whenever these principles can be suitably adjusted to such cases.

3. In abrasions, erosions, and ulcerations of the os, in the hyperplastic womb, in subinvolution, in cystocele, in rectocele, and in all conditions of disturbed or impaired nutrition of the pelvic organs, it affords a most efficient form of preparatory or curative treatment, tending to give the organs rest, restore their tone, deplete engorgement, remove blood-stasis, improve locomotive power, and arrest retrograde tendencies in general.

4. In pelvic inflammations, whether of cellular, peritoneal, tubal, or other origin or involvement, it will often change their current or arrest progress, prevent suppuration or abridge its ravages, and thus often guide to a successful issue without a final appeal to a formidable, and perhaps dangerous, operation.

HOT WATER IN THE TREATMENT OF EYE-DISEASES.

Dr. Leartus Connor, of Detroit, Mich., read a paper with the above title before the Section in Ophthalmology.

Dr. Connor stated that that remedy was sought after which would most certainly induce, first, good feeding of the tissue; second,

removal of morbid products and morbific agents; and, third, the promotion of speedy repair. Such an agent is hot water in a great variety of eye-affections, such as mild catarrhal and phlyctenular conjunctivitis, corneitis, affections of the sclera and iris, and even, in some cases, retinal hyperæmia. In iritis, where the pupil refuses to respond to mydriatics, hot water will exert a marked effect in assisting dilatation of the pupil. Similar beneficial results in reducing inflammatory action had been noticed by him in catarrhal and purulent ophthalmia, in relieving the pain in glaucoma and acute dacryocystitis.

There is no morbid state of the eye on which it may not exert beneficial influence. The results reported by divers observers vary with the different modes of using it. The water should be as hot as the end of the forefinger will bear without discomfort. The method preferred by the essayist was to take a common tumbler, fill it to the brim with hot water, and, inclining the head slightly forward, apply the rim of the tumbler to the side of the nose and to the brow and cheek about the eye, which brings the eye itself actually into the water. The amount of water loses its heat slowly, and does not require frequent changing, and the eye may be kept in hot water with very little trouble for hours at a time. Antiseptics may be added, and the remedy is easily attainable with means for application. It is safe without the watchful care of the physician, while moist heat by any solid substance, as poultices, should never be used except under the direct supervision of the attendant.

Poultices are unsafe and unreliable means of applying heat to the eye; also dirty, especially on denuded surfaces. Compresses are less objectionable, and may be used as a substitute for hot water.

Local effects: 1. Contraction of blood-vessels in and about the eye. Controls hemorrhages better than cold water, and blanches the tissues in conjunctivitis, blepharitis, phlyctenulæ; and after the use of hot water the ophthalmoscope shows the retinal vessels to be reduced in size. In one case where drawings were made of the vessels before and after, the difference was very marked, and the relief of retinal congestion and improvement of vision very noticeable.

The temperature of the water must vary with the sensations of the patient. The tissues should not be exhausted.

2. Hot water will wash away or destroy all morbific secretions or excretions. At a temperature of 132° F. it destroys the bacillus of anthrax and many others, and many eyes can bear a somewhat higher temperature.

3. It promotes the healthful activity of reparative tissue or protoplasm.

4. It exerts direct power in relieving muscular fatigue and spasm.

FEVER, ITS CAUSES, MECHANISM, AND RATIONAL TREATMENT.

Dr. Austin Flint, LL.D., of New York, delivered a general address with the above title, in which he reached the following conclusions:

1. Fevers, especially those belonging to the class of acute diseases, are self-limited in their duration, and are due each one to a special cause, a micro-organism, the operation of which ceases after the lapse of a certain time.

2. We are as yet unable to destroy directly the morbific organisms which give rise to continued fevers; and we must be content, for the present, to moderate their action and to sustain the powers of resistance of patients.

3. The production of animal heat involves oxidation of parts of the organism or of articles of food, represented in the formation and discharge of nitrogenized excrementitious matters, carbonic acid, and water.

4. As regards its relations to general nutrition and the production of animal heat, water formed in the body by a process of oxidation is to be counted as an excrementitious principle.

5. Fever, as observed in the so-called essential fevers, may be defined as a condition of excessive production of heat, involving defective nutrition or inanition, an excessive production and discharge of nitrogenized excrementitious matters and carbonic acid, with waste and degeneration of the tissues, and partial or complete suppression of the production and discharge of water.

6. Aside from the influence of complications and accidents, the ataxic symptoms in fevers, the intensity and persistence of which endanger life, are secondary to the fever and are usually proportionate to the elevation of temperature. These symptoms are ameliorated by measures of treatment directed to a reduction of the general temperature of the body.

7. The abstraction of heat by external cold and the reduction of temperature by antipyretics administered internally, without affecting the special cause of the fever, improve

the symptoms which are secondary to the pyrexia.

8. In health, during a period of inanition, the consumption of the tissues in the production of animal heat is in a measure saved by an increased production and excretion of water.

9. In fever, the effects of inanition, manifested by destruction and degeneration of tissues, are intensified by a deficient formation and excretion of water.

10. Alimentation in fever, the object of which is to retard and repair the destruction and degeneration of tissues and organs, is difficult mainly on account of derangements of the digestive organs; and this difficulty is to be met by the administration of articles of food easily digested, or of articles in which the processes of digestion have been begun or are partly accomplished.

11. In the introduction of hydrocarbons, which are important factors in the production of animal heat, alcohol presents a form of hydrocarbon which is promptly oxidized, and in which absorption can take place without preparation by digestion.

12. Precisely in so far as it is oxidized in the body, alcohol furnishes matter which is consumed in the excessive production of heat in fever, and saves destruction and degeneration of tissue.

13. The introduction of matters consumed in the production of heat in fever diminishes, rather than increases, the intensity of the pyrexia.

14. As the oxidation of alcohol necessarily involves the formation of water and limits the destruction of tissue, its action in fever tends to restore the normal processes of heat production, in which the formation of water plays an important part.

15. The great objects in the treatment of fever itself are to limit and reduce the pyrexia by direct and indirect means; to limit and repair destruction and degeneration of tissues and organs by alimentation; to provide matters for consumption in the abnormal production of heat, and thus to place the system in the most favorable condition for recuperation after the disease shall have run its course.

TREATMENT OF FRACTURES OF THE MAXILLÆ WITH MODIFIED INTERDENTAL SPLINT.

Dr. William Carr, New York, N. Y., gave a clinic on the treatment of fracture of the maxillæ with modified interdental splint, before the Section in Dental and Oral Surgery.

The majority of fractures of the inferior maxilla occur in the body rarely at the symphysis menti, but usually directly anterior or posterior to the mental foramen. A noticeable fact in connection with these fractures is that the victim rarely applies for treatment for several days succeeding the injury. He realizes that some of his teeth are loosened, and also that he is painfully bruised, but does not seek surgical aid until he becomes alarmed by the increased inflammatory condition of the parts. There is but little difficulty in establishing a correct diagnosis, as usually the following symptoms are present,—great pain in the effort to open and close the mouth, swelling, crepitus, inflammation, inability to masticate, and marked irregularity of the teeth.

Treatment.—It is identical with that of other fractures,—namely, to bring the parts into apposition and retain them firmly until ossification is completed. For treatment of fractures of the maxillæ there is nothing superior to the interdental splint. When properly adjusted, speedy union may be secured without deformity of the jaw or irregularity of the teeth. Before taking the impression a careful examination of the parts should be made. Loose teeth and spiculæ of bone should be removed, and the parts should then be brought as nearly as possible to their normal position. An accurate impression should be made with impression-compound or wax. The material used should be as warm as the patient can bear it, in order to prevent unnecessary pain, and also to prevent further displacement of the parts. The splint is made of vulcanite, and covers all the teeth of the lower jaw, and all the teeth posterior to the canine in the upper jaw, leaving a space of about three or four lines through which the patient may receive nourishment. Small holes are drilled in the splint over the grinding surface of each molar for the purpose of ascertaining whether its adjustment is proper.

The splint should first be adjusted to the sound jaw, then gently bring the fractured jaw into position until it has passed about two-thirds of the length of the teeth, then with a quick, firm motion bring the parts into position. Next apply a four-tail bandage, which should be retained from three to five days; after this time, in the majority of cases, it may with safety be removed during the day, but should be replaced at night until the removal of the splint. The patient should be furnished with an ordinary rubber syringe,

and instructed to keep the mouth thoroughly cleansed. For disinfectants the author uses peroxide of hydrogen, three per cent. solution, or a solution of bisulphate of sodium in the proportion of ℥i to ℥i of water.

In ordinary cases the splint should be retained for three or four weeks, according to the physical condition of the patient, unless unforeseen complications should arise. The application of the splint, combined with thorough cleanliness, will usually be all the treatment required.

The advantages, besides those previously stated, are that the patient experiences but little pain and inconvenience, and can, as a rule, attend to his business almost immediately after the splint is applied.

It is not necessary that all the teeth, nor, indeed, that any should be present in the mouth in order to make this splint serve its purpose. In the first case the rubber can be made to take the place of the missing teeth, and in the latter case a perfect adaptation of the splint to the alveolar ridges can be secured, and will be found to keep the parts in perfect apposition.

Should it be deemed advisable to place a splint in position within an hour or two after seeing the case, one can be constructed entirely of ordinary gutta-percha, with just enough wire inside to stiffen it. Dr. Carr demonstrated this last method; it is very simple, and can be made by any surgeon.

THE ACTION OF CERTAIN DRUGS ON THE CIRCULATION AND SECRETION OF THE KIDNEY.

Dr. Charles D. F. Phillips, of London, read a paper with the above title before the Section in Therapeutics.

This contained a number of very interesting experiments, made with Roy's onkometer, with caffeine, sparteine, strophanthine, digitalin, and ulexine.* He concluded that the flow of urine is not so much dependent on the blood-pressure as on the rate of flow of the blood in the renal vessels. With regard to this point it is necessary to remember that, although such drugs as strophanthine produce a great increase in the *force* of the cardiac beats, yet these are very much slowed, so that it is quite possible that, although the heart's action is stronger, yet the total amount of blood sent through any given organ, such as the kidney, in a given time, may remain the same; whereas such a drug as digitalis, producing, as it does, a rise of blood-pressure and a contraction of the kidney-vessels, may cause an increased quantity of blood to pass through the renal vessels. On this view one could find the explanation of digitalin being a diuretic and strophanthine not being one.

Inasmuch, however, as sparteine has not so marked diuretic action, we must also assume that digitalin must have some peripheral action on the secretory apparatus of the kidney.

His results were tabulated briefly as follows:

(A) DRUGS THAT FIRST CONTRACT AND AFTERWARDS DILATE THE KIDNEY.

(1) *Caffeine* in small doses induces in the stage of contraction a fall of blood-pressure, in that of expansion a slight rise. During the former the flow of urine *may* be arrested; during the latter it is always increased, such increase depending on dilatation of renal vessels.

(The possible *arrest* of secretion during the first stage is special to caffeine, and may be induced by large or repeated doses.)

(2) *Ulexine*—gr. $\frac{1}{6}$—greatly raises blood-pressure during the first stage (that of contraction); in the second, expansion is much greater in degree but shorter in duration than under caffeine, and is accompanied by brief but marked increase in urinary flow; the effective dose is limited by its toxic action on respiratory centres. Practically, *excess* of caffeine induces only the first stage, *excess* of ulexine only the second.

(B) SUBSTANCES THAT DILATE THE KIDNEY, BUT TO LESS EXTENT AND MORE SLOWLY THAN CAFFEINE AND ULEXINE,

are dextrose, urea, sodium chloride and acetate, and probably all constituents of the urine.

(C) DRUGS THAT CONTRACT THE KIDNEY WITHOUT SUBSEQUENT EXPANSION.

(1) Digitalin, with *increased* secretion of urine (probably resulting from general heightened blood-pressure).

(2) Sparteine, with *diminished* secretion (in health, at least).

(3) Strophanthine causes slight temporary contraction, with no marked increase of secretion.

(4) Apocynēine, similar to temporary contraction, and no definite increase of secretion.

(5) Turpentine, (6) adonidin, and (7) barium chloride give similar results.

In conclusion, it seemed to him that the

* This is an alkaloid from the gorse, *Ulex europæus.*

plethysmographic method of experimentation is a valuable one for determining the exact action of drugs on the circulation, and one that deserves more attention than it has hitherto attracted.

A NEW METHOD OF TREATING DISEASES OF THE SKIN LOCALLY.

In the Section in Dermatology and Syphilography DR. VALENTINE KNAGGS, of London, England, proposed as a substitute for ointments the employment of emulsions, which, upon drying on the skin, form protective films. He had employed these dressings for the past two years with gratifying results in eczemas and other non-specific exudations. The inunction of the body with fixed oils has been found of immense service, but they are not adhesive, and exuding fluids readily escape from the surface. There are two methods of rendering oily substances adhesive,—1. By adding to them resinous, gummy, or alkaline substances; 2. In making use of gums to combine or emulsify a fat with water.

Adhesive preparations, unlike oils, tend to arrest skin-action. Thus tar, varnish, or collodion form an impervious covering. Ointments to which adhesive substances are added diminish skin-action, but do not abolish it.

Well-made emulsions resemble milk or cream, are soluble in watery fluids, and are markedly adhesive, and are made by combining an ointment-basis with water, a vegetable gum, and a suitable antiseptic.

Thus the formula preferred would read:

℞ Paraffine molle, ℥i;
Pulv. gum acac., gr. clx;
Boracic acid, gr. xvi;
Aquæ, ad ℥ii.
Stir until emulsified.

Bismuth, zinc, sulphur, or other medicament may be added as desired. Smeared over the skin, a film is formed, which is flexible and protective, and the antiseptics and medicaments have the best opportunity of exercising a beneficial influence.

The author called especial attention to the fact that all lint and textile dressings could be dispensed with. He did not expect these gum emulsions to displace older methods, but that they would serve a useful purpose.

In discussing the paper, DR. UNNA said that we were now in the period of transition, making our annual change of treatment. It was very well for us as specialists to discuss new treatments, but we should not give them to the general practitioner until we were quite sure that they were good, and especially should not confuse him with new treatments until we were quite sure that they were new. He had worked much with fixed dressings and varnishes, and some years ago had described such a varnish as had the reader of the paper. He was glad to confirm the reader's claim regarding the utility of the emulsion-dressing, but could not concede to him that it was new, as there are many other varnishes made with gums and fats. He did not believe that any varnish which is soluble in water can prevent a great amount of evaporation from the skin.

A NEW METHOD OF TREATING THE VEGETABLE PARASITIC DISEASES OF THE SKIN.

DR. H. J. REYNOLDS, of Chicago, Ill., read a paper with the above title before the Section in Dermatology and Syphilography, of which the following is an abstract:

First, the parasiticide must be applied so as to reach the bottom of the hair-follicles in favus, ringworm of the scalp, and barber's itch. He proposed to apply the medicament to the diseased part and place over it the positive pole of an electric battery, and the negative upon some other part of the body, and induce the penetration of the solution to the deeper parts by a well-known law of electro-physics. He uses a battery composed of a large number of small cells, such as is used for the removal of hairs. The strength of the current must vary with the sensitiveness of the parts,—five to fifteen cells, according to the feelings of the patient. Where there is much hyperæmia the current must be weakened. Cocaine, applied in this way, produces anæsthesia of the whole scalp. The surface is first to be thoroughly cleansed. Then saturate the sponge of the positive electrode with the parasiticide solution and place over the diseased patch, and the moist negative sponge over the skin of some other part of the body. A one per cent. solution of the bichloride was the parasiticide employed in the cases reported. He had only had an opportunity to thus treat three cases, but all have been so successful as to give him great confidence in its usefulness.

RECENT VIEWS AS TO THE PATHOLOGY AND TREATMENT OF TUBERCULOSIS OF THE LARYNX.

MR. LENNOX BROWNE, of London, read a paper before the Section in Laryngology with the above title.

The tubercular bacilli are generally ad-

mitted as a cause of specific laryngitis. Entrance is effected through the air-passages, and they are especially liable to accumulate in the upper parts of the lungs, where there is less respiratory action. The disease is usually secondary to pulmonary tuberculosis, and may be due to infection from the bacilli in the sputa coughed up and inoculating some abraded or unhealthy and irritated portion of the larynx, or the germs may find their way thither through the lymphatic system. The bacilli, like all parasites, act as an irritant, and eventually cause breaking down of the tubercular deposits.

They must have an unhealthy or abraded surface on which to locate and thrive, and are prone to choose some weak point. Whether carried by the air, sputa, lymphatics, or general circulation, cases are recorded of infection through wounds and teeth that have been extracted. The author of the paper quoted cases confirming the same.

The state of the health and the assimilation of food, together with tissue-nutrition, have more to do with the development of tuberculosis than have locality or climatic conditions. Not only may we have laryngeal tuberculosis as a secondary infection, but we find cases where it is primary. The laryngeal symptoms may be the first to attract attention, and even become far advanced before pulmonary lesions can be detected. This is confirmed by many observers. The bacilli are recognized in the sputa, there is pain in the larynx, and difficult deglutition.

The larynx presents the specific appearance. We find the infiltration, swelling, and ulcers, but still can detect no pulmonary lesion. There must have been some neglected chronic laryngitis, or some solution of continuity when exposed to the presence of these germs. Cases are reported where these local symptoms have yielded to treatment before pulmonary complications were added, and the patients were discharged apparently cured.

Treatment.—Where the general system is not broken down, or the disease advanced to the lungs, sea- or mountain-air and high altitudes, especially in pine regions, are of vital importance. Oxygen, pure air, and the absence of germs are here more to be relied on than the thermal or climatic agents. Dr. Moore has ceased to advise the inhalation of medicated steam, but prefers oxidizing agents. Inhalations of vapor from turpentine, oil of eucalyptus, and menthol he has used with success.

It is well established that tuberculosis is a blood-poison, as are pyæmia, septicæmia, and the like. Germicides should be used, and benefit will result. He places great confidence in atropine, not only as a sedative, but as a germicide as well. Arsenic often works in the same manner as does mercury in syphilis. So, also, do the salts of calcium, where there are tubercular deposits. The aniline treatment has not been a success, and the gaseous injections are still on trial. Experiments with sulphuretted hydrogen show temporary improvement, with diminution of the amount of sputa expectorated, less pain, and less distress from persistent cough. Still, the permanent benefit is doubtful. This treatment needs careful supervision, and should not be trusted to the patients or their friends. The local treatment of tubercular laryngitis gives the best results, especially where systemic treatment is also employed to maintain health and nutrition. Use cocaine, and employ the galvano-cautery or lactic acid to destroy the deposits and induce healthy healing of the parts.

Where the infections are local, our success is in proportion to their accessibility.

He does not like iodoform or iodol dissolved in ether, as the ether is too much of an irritant, and prefers a brush made with cotton to the spray, in that it coats the surface better and is pressed into folds which are protected from the spray by the spasm of the larynx. The continued use of the spray he considers dangerous to the ciliæ of the epithelial cells. Local and systemic sedatives are emphatically called for. Insufflation is not as good as where emulsions are made with acacia, as it is apt to form cakes. Cocaine gives temporary relief, but morphine, belladonna, and balsam are more permanent in their relief of both pain and cough.

The surgical measures are to scrape away the deposits with curette or forceps, under cocaine, and apply lactic acid. Do not stab or incise; it may relieve tension and congestion, but is bad in that it gives new foci for infection. For the same reason it is better not to remove glomerulata unless respiration is seriously interfered with. Tracheotomy, for the purpose of giving rest to the larynx, is useless, and worse. The larynx does not then receive the necessary air and oxygen, and bacilli-infected mucus accumulates. The cold and dry air irritates the lungs and may induce pulmonary complications. Besides, the wound may become infected. Intubation of the larynx likewise causes too

much irritation and aggravates the trouble, independent of the risk of blocking up the tube. Even refrain from removing an elongated uvula. He does not approve of the recent suggestion of extirpating diseased portions.

Many apparent cures are reported, and he has had such cases himself, but is inclined to doubt their permanence. We can improve the condition of the larynx, stop pain and cough, cause better assimilation of food, and improve nutrition. There result local relief and apparently satisfactory results, but scarcely a cure, as claimed by Schmidt, Bosworth, and others.

Important Suggestions.—1. Early diagnosis and treatment. 2. Do not be carried away with new remedies. 3. Never be too active in destroying tissue; heal instead. 4. It is better to observe facts and be influenced by the experience of many, than by the new ideas of the few.

ON THE PHARMACOLOGY OF SOME BODIES DERIVED FROM MORPHINE.

Dr. Ralph Stockman, of Edinburgh, read a paper with the above title before the Section in Therapeutics.

The experiments were conducted jointly by D. B. Dott, F.R.S.E., and Ralph Stockman, M.D. The relationship between chemical constitution and physiological action must always be a subject of deep interest to pharmacologists. In this short paper they proposed to mention briefly the changes in action resulting from various modifications in the constitution of morphine.

How, in 1854, by acting on morphine with methyl iodide, obtained a body which he named hydriodate of ethylmorphia, and which he regarded as a substitution product, the methyl iodide being supposed by him to replace one of the hydrogen atoms in morphine. In the light of our present chemical knowledge How's body may be regarded as an addition product, iodide of methyl (CH_3I) being simply tacked on to the morphine molecule.

In 1869, Crum Brown and Fraser investigated this body among others, and showed that the original action of morphine is quite lost, and a curare action substituted in its stead. From their nomenclature there can be no doubt that these observers regarded such bodies as addition and not as substitution compounds. Notwithstanding this, the authors find that in all text-books and reference-books these substances are always named and described as if they were substitution and not addition bodies. It is at present generally held that the substitution of methyl for hydrogen in an alkaloid causes the latter to act like curare, no matter what its original action may have been. The addition products, however, are very different in action from the substitution products.

The formula of morphine is $C_{17}H_{17}NO_3(OH)_2$, and it contains, therefore, two molecules of hydroxyl. It is the hydroxyl-hydrogen atoms which are replaced most easily by alcohol radicals. With regard to the action of morphine it may be divided into two stages,—(1) narcosis, succeeded by (2) tetanus. Methylmorphine, $C_{17}H_{18}(CH_3)NO_3$, is morphine in which one H has been replaced by CH_3. Codeine has the same constitution, and this body is simply codeine prepared artificially from morphine. The action is exactly the same as that of codeine derived directly from opium.

Ethylmorphine, $C_{17}H_{18}(C_2H_5)NO_3$, has the same action exactly as methylmorphine.

Acetylmorphine, $C_{17}H_{18}(C_2H_3O)NO_3$, and diacetylmorphine, $C_{17}H_{18}(C_2H_3O)_2NO_3$, have a similar action to the two preceding bodies. That is, they produce narcosis in very small doses, which is followed by tetanus when larger doses are given. All these bodies are much more active than morphine, and smaller doses are required. In dogs, however, they produce much greater distress and much more marked vomiting and diarrhœa. From examination of their action, the authors think that none of them is in a position to replace morphine clinically.

SO-CALLED ANTISEPTIC ACTION OF CALOMEL WHEN GIVEN IN LARGE DOSES.

Dr. George S. Hull, of Chambersburg, Pa., read a paper with the above title before the Section in Therapeutics.

In cases of dysentery most prompt results in relieving tormina and changing the character of the stools were manifested. It acts as a cholagogue, producing a free flow of bile, sweeping out the contents of the bowel, and as a mercurial it exerts an antiseptic action. In cholera its usefulness in large doses has been advocated by some and denied by others.

In the discussion the relative value of large and small doses of calomel was freely considered by the members of the section.

In closing the discussion, Dr. Hull said that he was dealing with epidemic dysentery, and not with ordinary dysenteric conditions.

The first effect of the calomel is to empty the bile-ducts and get a large flow of bile, and relieve the congestion of the liver and intestinal vessels. The second effect is due to the solution of the mercurial in bile, as pointed out by Headland, and this probably acts as an antiseptic in the bowels. The object is not simply to purge the patient, but to obtain a copious bilious discharge from the action on the liver. Where the tongue was most coated he got the best results. He believed that patients are killed by the use of opium and astringents.

NOTES ON THE TREATMENT OF PHTHISIS, MORE PARTICULARLY THAT BY INTRA-PULMONARY INJECTION.

R. Singleton Smith, M.D., London, F.R.C.P., Physician to the Bristol Royal Infirmary, England, read a paper on this subject before the Section in General Medicine on Thursday, September 8. Since the last International Congress at Copenhagen, in 1884, numerous attempts have been made to do more than had previously been attempted for a disease in which the *vis medicatrix naturæ* does so little. The reader of this paper briefly summed up the various methods which have been recently suggested since the discovery of the bacillus of tubercle, and expressed his belief in the possibility of benefit by treatment directed towards the destruction of the bacillary growth. He reported the result of his experience with regard to gaseous rectal injections, and said that in consequence of the absence of all indications of benefit he had given up this method entirely. He alluded to the work done by Professor Pepper, of Philadelphia, and Drs. Beverley Robinson and White, of New York. In carrying out the method of intra-pulmonary injections suggested by these and other workers he had met with partial success in a series of cases reported in the *British Medical Journal* of 1886.

In consequence of the proved utility of iodoform in chest-disease, as shown by a steadily-increasing mass of evidence since its first introduction for this purpose by Professor Semmola, in 1878, and supported by a series of cases presented to the International Congress of 1884, in which the author found increase of weight, improved appetite, diminution of temperature, and general improvement, under the administration of iodoform given by the alimentary canal, it was thought that iodoform would be the best substance to employ for injection into the parenchyma of the lung. The clinical utility of iodoform being the ground on which its use for this purpose has been founded, the evidence is not shaken by any statistics as to the comparatively feeble powers of the drug as a germicide.

The insolubility of the drug is the chief difficulty; various solvents have been used, but with only partial success. Ether is objectionable because of its effects on the brain; giddiness and other feelings of discomfort rather alarm the patient, and give rise to an unwillingness to have a frequent repetition of the injections. Eucalyptus oil is irritating: two cases were mentioned in which acute pleuritis, with much pain, rise of temperature, and effusion had followed the injection of an iodoform solution in oil of eucalyptus. The vaseline oil, either alone or in combination with eucalyptol, had also been used, but the author still considers the question what is the best fluid to inject to be still unsolved. He did not advocate the use of solutions containing free iodine or bichloride of mercury, and he would not in future employ any fluid for injection into the lung which had not previously been tested hypodermically; if it gave rise to much inflammatory irritation in the subcutaneous cellular tissue, he would not venture to inject it into the lung. He was of opinion that injections into cellular tissue might possibly be of some little service, although there was as yet not much reliable evidence on this point, but they would serve as a reliable test whether any given fluid was suitable for deep intra-pulmonary injection.

It is true that if iodoform be of use, as the clinical evidence indicates, then it is likely to be of far greater utility when injected, even in small quantity, into the focus of a diseased patch than when given in larger doses diffused throughout the whole body. Such injections have been shown to be not especially hazardous. Even the cases in which pleuritis has occurred had recovered completely from the attack in the course of a few days, and possibly the pleuritis was due to the failure of the fluid to pass beyond the pleural cavity into the lung-substance. Nevertheless, the author would not advocate the use of such injections in cases which were hopeless, neither would he employ them in cases where other and less active measures were accomplishing the object in view. He concluded his paper by urging perseverance in spite of failure, and by expressing his belief that what

as yet was only a tentative investigation would ultimately result in numerous and signal successes.

DEVENTER'S METHOD OF DELIVERY OF THE AFTER-COMING HEAD.

Dr. John Bartlett, of Chicago, Ill., presented a paper with the above title before the Section in Obstetrics, supplementing the paper with a demonstration upon the phantom.

Deventer spoke in the most confident manner of the success and safety of podalic version, and of the ease with which the head could be delivered, but did not describe his method, which, however, Dr. Bartlett had found mentioned in Smellie's work. Deventer's method was shown to consist of a reversal of the so-called Prague method, in that the body of the child was carried far backward towards the perineum, with the view of turning the occiput out from under the pubes, the anterior surface of the neck resting on the perineum. At the beginning the occiput of the child was turned forward so as to come under the pubes as the child was drawn down. The arms were *not* to be drawn down, but left up alongside the head, being placed so as to come anterior to either parietal base. The delivery by traction backward upon the body was to be aided by pressure made immediately above the pubes, the wedge formed by the head and arms being decomposed by the withdrawal of the larger transverse diameter of the head from between the arms, as descent of the head accompanied by extension occurs. The mechanism was only favorable when the occiput was anterior. Deventer never lost a child or tore a mother. The arms, being left up, protected the neck of the child and allowed a passage for the cord alongside of them, so that haste was not as necessary as with ordinary methods, and, occupying a broad and yielding part of the pelvis, they did not obstruct delivery. The method was a plausible one, and certainly worthy of trial in suitable cases.

THE CURABILITY OF DETACHMENT OF THE RETINA.

Prof. X. Galezowski, of Paris, France, opened the session of the Section in Ophthalmology on Thursday, September 8, by reading a paper with the above title. He stated that the pathology of the disease is not entirely clear.

The writer had observed in twenty years, among 152,000 persons, 789 detachments, of which 87 were in both eyes, 63 in emmetropic and hypermetropic eyes, and 194 were traumatic; 13 occurred after extraction of cataract, 18 were syphilitic, and 4 in sympathetic affections. Tumor was found in 10 cases. Twice only he found detachment in retinitis albuminurica, although he frequently saw this affection. Cataract is very frequent in detachment of the retina.

Occasionally tearing of the retina is noticed, with the corpus vitreum introduced behind the retina, between the choroid and retina. He could say that the rupture of the retina is not so frequent, and considers it the consequence and not the cause of the detachment. Professor Graefe has said that the detachment is not curable, and the function of the retina is not restored. Dr. Galezowski had seen a case which showed alterations in the retina at the place of detachment, which had been completely cured. The patient gave the usual history of trouble with the vision, coming on suddenly and continuing for one or two or three months, with afterwards recovery of sight. He explained the appearance of the fundus as seen by the ophthalmoscope, and illustrated them on the blackboard.

The conditions predisposing to detachment were said to be (1) choroiditis; (2) liquefaction of the corpus vitreum. In treating these cases he begins with antiphlogistic treatment, atropia, rest, etc., and he had in seven cases a complete cure,—the retina completely adherent, and around the line of the separation atrophy, with pigment-deposit and choroiditis disseminata. The first indication is antiphlogistics. Apply every month two, three, four, or five leeches, then atropine, and warm and cold compresses alternately, and in the intervals between the leeches he applies derivative plasters. Inside of five months he has completely cured detachment of the retina. Mercury and potassium iodide are also useful where exudation is present, or in cases of constitutional disease.

Fifteen years ago he proposed iridectomy to stop the inflammation of the choroid, but it did no good in that way, although it stopped the iritis. Now he proposes a new operation. He considers the exudation behind the retina as being of the same character as the effusion in pleuritis or peritonitis, and has had an instrument (which he exhibited) made to aspirate the fluid. The instrument is a syringe with a stop-cock and an aspirating-needle. He introduces the needle through the sclerotic at a considerable distance be-

hind the ciliary body, and passes it into the globe for some distance. Then he exhausts the air by drawing out the piston. If the needle-point is too far in, no fluid appears in the barrel of the syringe, but on withdrawing the needle gradually the fluid appears, and one, one and a half, and two grammes are generally obtained. There is no inflammation after the operation. By this means two out of seventeen cases operated on were completely cured, and there is a certainty of amelioration in all cases.

In old cases he introduces a curved needle from behind forward through the sclera and the detached retina, before introducing the aspirating-needle, and when the fluid is drawn off a catgut ligature is drawn through as a seton and brought tight.

SEBORRHŒAL ECZEMA.

Dr. P. G. Unna, of Hamburg, Germany, read a paper (with microscopic demonstration) on "Seborrhœal Eczema" before the Section in Dermatology and Syphilography. The author does not consider that the diagnosis "acute" or "chronic" eczema is a sufficiently exact and scientific one. For example, there are three distinct types of infantile eczema of the face, viz., a nervous, a tuberculous, and a seborrhœal. The nervous type is seen in the eczema of dentition, appearing upon a perfectly sound skin, usually first upon the cheeks and then upon the forehead. The eruption itches in proportion to the strength of the infant and the thickness of the epidermis. The vesicles, at times, suggest in their appearance and their reddened base herpes zoster, but the marked symmetry of the lesions and the tendency to relapse would prevent such a diagnosis. Seborrhœal eczema is entirely different, in that the skin is not in a previously healthy condition. A seborrhœa has existed upon the scalp probably a few weeks after birth, which often spreads over the upper portion of the face after becoming somewhat moist. There is less itching than in the eczema of dentition. For the latter affection a zinc-ichthyol ointment is recommended to be applied and covered with a mask, together with the bromide of potassium, internally, to allay nerve-irritation. In seborrhœal eczema sulphur should be added to the zinc ointment. Ichthyol is useless, but resorcin acts well.

Dr. Unna regards all so-called dry seborrhœas as chronic inflammatory processes of the skin, and his studies convince him that there is no hypersecretion from the sebaceous glands which can clinically be considered a dry seborrhœa, produced by a deposit upon the surface of the product of these sebaceous glands. The disease which Unna has named eczema seborrhoicum is dependent upon a condition of, or rather change in, the coiled or sweat-glands, giving rise to the secretion of fat by them. An increase of fat upon the surface indicates increased activity when it proceeds from the sebaceous glands, but when the sweat-glands pour out fat it is because of the death of their endothelial cells.

Almost all seborrhœal eczemas have their starting-point in the scalp. Three forms are described. In one, eczema seborrhoicum begins as a latent catarrh of the scalp, and goes through the stages of scaly formation and dryness, finally ending as a hyperidrosis oleosa. In the second, the scales heap themselves up between the hairs into fatty crusts, and cause the hairs to fall out. A corona seborrhoica upon the forehead, at the margin of the hair, is described, which is typical of this form of the affection.

The third form is that in which the catarrhal appearances are the most pronounced, and in which "weeping" occurs, especially about the temples and eyes. This follows a simple itching pityriasis, and produces the appearances of a moist, shining eczema. A pityriasis or a seborrhœa may exist upon the scalp, while at the same time an eczema is present upon the face. The chest is affected with the crusty form almost exclusively.

Upon the arms there is a predilection for the flexor surfaces, which is explained by the *rôle* the sweat-glands play in eczema seborrhoicum.

Upon the legs, early in the disease, we find only the large papular and crusting forms.

Patches of seborrhœa about the mouth and nose of old people are often the starting-points of carcinoma. In almost all cases of eczema seborrhoicum of the scalp, a simple, itchy scaliness of the ear is observed. A patch of eczema seborrhoicum is extremely stationary, remaining for years possibly without much change in size and giving rise to only slight symptoms. Beginning upon the scalp or head, as a rule, it extends to other parts below in a very gradual manner, especially locating upon the face, sternal and intra-scapular regions. This course is so the rule as to be regarded as pathognomonic, as no other eczema or psoriasis runs this course.

When the whole body becomes involved it

resembles closely pityriasis rubra. Psoriasis is often confounded with seborrhœal eczema. The latter attacks the parts near the median line of the body, and is more stationary than psoriasis. It is preceded by a local seborrhœa, and the scales and crusts have a decidedly fatty character. The patches have also a peculiar configuration, and spontaneously flatten out in the middle or upon one side. The prognosis is more favorable than in psoriasis. The cure is not easy because the deep-seated sweat-glands are implicated. Sulphur is the great remedy for the disease. More active remedies for the scaly and crusty forms are pyrogallol and resorcin. Internal treatment is seldom required. Once cured, prophylactic measures, such as hygiene of the skin, must be employed.

IODOL IN SURGERY.

Dr. George Assaky, of Bucharest, Roumania, read a paper on "Iodol in Surgery" before the Section in Surgery on Friday, September 9. The conclusions arrived at were: (1) Wounds unite under iodol by first intention. This union, however, being the result of various and complex conditions attending operation, it is not possible to attribute to iodol alone the absence of suppuration and inflammatory conditions. In wounds which gape and suppurate, iodol is an excellent antiseptic. It rapidly retards suppuration, renders it inodorous, reduces the frequency of dressing, and hastens considerably cicatrization. In ulcerating or gangrenous wounds iodol aids to resist the destructive process, and changes the wound, after a variable time, to a healthy, granulating condition. This action of iodol extends itself to hard chancres. In case of soft chancres the result is variable. Sometimes it transforms them into a simple wound with brief delay; at others it is insufficient for this purpose, and it becomes necessary to employ in addition, locally, antiseptic lotions.

The same is true with reference to open venereal buboes of the groin. The powdered iodol has this advantage over iodoform, that it is free from odor and is not toxic in its effects.

(2) Doses of iodol of from 0.40 centigramme to 2.0 grammes daily produce no functional trouble, even if continued a long time.

These doses give marvellous results in tertiary syphilis and in scrofulous affections. In the secondary stage of syphilis, taken internally, it rapidly destroys the syphilitic manifestations. Iodol seems to aid the general nutrition and increase strength and flesh. It is indicated in all cases of specific malnutrition.

Iodol is an antipyretic. In acute infectious diseases, such as erysipelas, etc., it causes a rapid fall of temperature.

THE TREATMENT OF ABSCESSES AND ULCERATIONS OF THE CORNEA WITH JEQUIRITY.

Dr. E. Smith, of Detroit, Mich., read a paper with the above title before the Section in Ophthalmology on September 9. He remarked upon the experience, common to all, of the difficulty in procuring the absorption of pus in the cornea, and noted the existence of the same tendency in all closed abscesses. The best means of arresting suppuration and of getting rid of the pus when formed has engaged the attention of the writer, with many others, for years. A paper on the above subject, in the spring of 1883, with another published in October, 1883, gave the result of his observations up to that time. He had since had many cases of ulceration of the cornea speedily relieved, and an astonishing clearing up of the cornea, after its use. He believes the remedy affects the proliferation in corneal corpuscles. After explaining his impression of the mode of action of the remedy, he proceeded to describe his manner of using it. He does not use a strong preparation, and aims not to produce a sharp inflammation, as is done in trachoma. He uses a three per cent. solution, or a very minute quantity of the powdered seed. It is applied sparingly, till a mild catarrhal inflammation is set up, characteristic of the remedy, and in some cases there may be slight membrane. The object is to avoid a high degree of reaction. The eye is kept washed out with a two per cent. solution of boric acid, and the result is almost uniformly surprisingly good. The corneal cicatrix is often hardly apparent to any one but the patient.

Dr. Galezowski, of Paris, France, did not like jequirity. In his observation it had frequently produced ulceration and destruction of the cornea and synechia anterior, and in some cases enucleation had to be made to avoid sympathetic trouble. He thought jequirity exerted a very bad action on the cornea. The modification in Dr. Smith's method is doubtless in the amount of the

drug used. Dr. Galezowski thought it a dangerous method.

In intermittent fever he had found ulceration of the cornea, which yielded to the administration of quinine. In another case, lasting for several months, after the extraction of a tooth, cicatrization occurred. The best treatment for corneal abscess and ulcer is the antiseptic method. He applies the powdered iodoform directly to the surface three times a day, under cocaine, and uses the steam douche two or three times a day, ten minutes at a time. When it is not doing well cauterization with a solution of nitrate of silver, 25 centigrammes to 10 grammes, may be done one or two times every day.

Dr. Richey, of Washington, D. C., wished to know whether scraping the ulcer before applying the remedy had not been found of advantage.

Dr. Smith, in closing, said that Dr. Galezowski had used jequirity in trachoma, in the way described by De Wecker, till he obtained marked diphtheritic membrane. In these cases it was the swelling and chemosis that caused strangulation and loss of cornea. He should hesitate to use jequirity in sthenic cases; it was the asthenic cases requiring stimulation that were suitable for this treatment.

THE CHEMISTRY AND PHARMACOLOGY OF THE NITRITES AND OF NITRO-GLYCERIN.

A paper with the above title, by George Armstrong Atkinson, M.B.C.M., was presented, and in the absence of the author was read by Dr. Ralph Stockman, of Edinburgh, before the Section in Therapeutics on Thursday, September 8, fourth day.

The action of the salts of nitrous acid resembles closely those of the acid which is the essential basis of this group of medicinal agents. Nitrous acid is remarkably unstable; in watery solution of $\frac{1}{3000}$ it may be used for a day or two for experimentation, but it has no advantage over a solution of nitrite of sodium, which possesses identical effects in so far as an acid can be considered identical with one of its salts. Our knowledge of the action of the nitrite group has been chiefly derived from a study of the effects produced by nitrite of amyl. Since here the base (amyl) has a decided action of its own, it is necessary to select a salt in which the base in its combination possesses no well-marked physiological activity. The resemblance between the action of sodium nitrite and amyl nitrite has been pointed out by Gamgee, Lauder Brunton, Hay, Leech, and others. Barth described its highly poisonous qualities. Binz showed that it caused death from general paralysis, especially of the muscular system, no convulsions preceding the fatal issue. Reichert considered it identical in its toxic effects with potassium nitrite. Its effects may be summed up as a paralyzer of muscular tissue, non-striated muscle being affected less quickly than striated. The brain-centres are also affected. The blood becomes of a chocolate color in mammals (methæmoglobin), respirations are slowed, temperature slightly lowered. Death occurs in frogs from cessation of respiration; after the heart has stopped its movements, it is found in full diastole and quite inexcitable.

Post-mortem rigidity comes on early. In rabbits, 3 grains were a fatal dose in one three pounds in weight. The same appearances were found post-mortem. In man, small doses (8 grains) produced great tendency to faintness and considerable acceleration of pulse, and decided lowering of arterial tension. Paralysis of respiration is due to the effect of the nitrite on the muscular system chiefly, but also in part to the effect on the medullary centre. Small doses slightly increase the flow of urine; large always diminish it. Urea and uric acid are almost unaffected. Sugar appears in the urine of rabbits after some hours, if the animal be kept very decidedly under the influence of the drug, but rapidly disappears if the administration of the drug be stopped. The nitrite is largely destroyed in the system, being partly, however, excreted as nitrate, partly, probably, as urea; a portion of it is excreted as nitrite.

The pharmacology of the other nitrite is briefly dismissed. Nitrite of potassium, nitrite of ethyl, nitrite of amyl, act in very similar manner to the sodium salt. Nitro-glycerin acts partly as a nitrite, and partly *per se*. In small doses it exerts the nitrite effect as a paralyzer; in large doses it produces convulsions.

Dr. Murrell, of London, England, referred to his discovery of the usefulness of nitrite of amyl in the condition of angina pectoris, and he always advised patients to carry the medicine in a small bottle. The pearls he considered too expensive for use. The taballæ (Ch. B.) of nitro-glycerin, made with chocolate, he considered dangerous from their resemblance to confections. He has used nitro-glycerin in one per cent. solution (dose ♏ v–xv) in cases of neuralgia of the

fifth nerve, surgical shock, asthma (spasmodic and cardiac), and reflex neuroses. He preferred this in epilepsy to the nitrite of sodium, which had been recommended by Dr. Law. In angina, patients can take 15 minims when they feel the attack coming on; such patients should carry a small bottle with them for immediate use when they feel the attack coming on, otherwise they might perish before the agent could be obtained. He gave an amusing instance of the difficulty of obtaining nitro-glycerin in England at present.

ON THE MAXIMAL DOSES OF DRUGS.

DR. L. LEWIN, of Berlin, read a paper with the above title before the Section in Therapeutics.

Of the many difficulties which pharmacotherapy has to strive against, the dosage of medicine is by no means the least. Variation in dose arises (1) from the differences (*a*) between one person and another; (*b*) between single individuals at different times; (*c*) between the intensity of the disease in men suffering with the same affection; (*d*) between diseases in which the same drug is used. (2) From the variability in the activity of the greater part of our remedies.

At the same time it is possible and desirable to establish the usual dose of agents which are active in relatively small quantity, and which readily produce toxic effects when the dose is increased. Two groups of preparations fall under this head: (1) Plants (crude) and plant-products, and their pharmaceutical representatives; and (2) chemical substances such as metalloids, metallic salts, and carbon-compounds.

The first group is almost universally inconstant in its effects, and thus far an international agreement as to their maximal doses has not been possible. The remedies of the second group, on the contrary, are nearly uniform, and the doses beyond which they cannot be given without danger can be determined by physiological experiment; but although the basis for such agreement is tolerably broad, yet the statements given in different pharmacopœias in many cases vary greatly. Such variation can be easily explained in the case of the first group, but becomes incomprehensible in the second.

From the results of his own observation and a comparison of the most of the pharmacopœias which give maximal doses, the author had constructed a table of the ordinary maximal doses of many of the drugs belonging to the second group, which he appended to this communication. Such a list should be added to the pharmacopœias of such countries as have no maximal dosage, for the convenience of the practitioner, who thus would be enabled to prescribe such drugs with confidence, even if they should not be generally used in his own country. From this Congress he hoped the influence would go out which would make such an international agreement possible.

RESORCIN AND ITS PREPARATIONS.

DR. JUSTUS ANDEER, of Munich, read a paper with the above title before the Section in Therapeutics. In this paper the author briefly gave the result of ten years' experience with pure resorcin. He had found it non-toxic, antiseptic, and possessing many advantages over carbolic acid, being free from odor and non-corrosive to the skin. He had obtained excellent results from it in eczema, in keloid, and in parasitic skin-diseases, as well as diseases of mucous membranes. In the form of keratine-coated pills it can be given for bronchitis, or in combination with castor oil (one to two per cent.) for diarrhœa and dysentery. For local use it may be combined with cacao-butter as a salve, or it may be made up into a soap of varying strength, from one per cent. up. Failure to obtain satisfactory results from its use may arise from not using a chemically pure resorcin, or from giving it in insufficient doses.

DR. LEWIN said that all are familiar with the writings of the lecturer upon the subject of resorcin. He thought that by devoting exclusive attention to this one member of a group the others might be in danger of having their value slighted. What is the value of thymol? What does resorcin accomplish more than phenol, carbolic acid, and others of this class? He questioned the statement that resorcin is not toxic, since it can, in large doses, present a condition of cerebral confusion and excitement which closely resembles mania.

DR. ANDEER replied that the agent was an efficient antiseptic, tasteless, odorless, and, in ordinary doses, free from toxic effects. He considered it a valuable addition to our therapeutic resources, and superior to phenol and thymol in many respects.

Correspondence.

PARIS.

(From our Special Correspondent.)

With the month of August the *season of vacation* has begun. The schools of medicine and of pharmacy have closed, and the professors have left the city, together with the four thousand medical students and the nine hundred pharmaceutical, or most of them. The library of the faculty closed its doors on the 1st, that of the College of Pharmacy on the 15th, and all the medical and pharmaceutical societies, as well as most of the scientific, have adjourned their meetings till October. The Academy of Sciences alone, faithful to time-honored precedents, continue their weekly sittings, but with so limited an attendance this year that they intend next summer to take some vacation, like the rest of the scientific world. And yet lately they had the visit of Dom Pedro, the emperor of Brazil, no doubt so well remembered by Americans, who, as one of the eight foreign corresponding members of the academy, attended several of the meetings, and took a share in the discussions.

But it is an ill wind that blows nobody good. While the physiologists, biologists, and toxicologists, both medical and pharmaceutical, are thus depriving Paris of their presence, the unfortunate dogs, cats, and guinea-pigs enjoy some rest from the experiments which they share in so interested a fashion. *Vivisection* and toxicology are no doubt useful and even fascinating studies, yet it cannot be denied that much unnecessary and wanton cruelty is practised under the cloak of scientific investigation. True, there is here a powerful society for the protection of animals, and also, it seems, an *antivivisection society*, aided by its British homonyme; but their first united effort, made the other day in a most injudicious manner, was a failure. After advertising a public meeting with bills partly in French and partly in English, they chose for a lecturer Madame Marie Huot, the same who hissed at the unveiling of Claude Bernard's statue, interrupted a medical lecture by striking the professor on the head with her umbrella, disturbed a pro-Pasteur meeting with constant interpolations, and in general made herself obnoxious by sensational vagaries. The meeting has been disastrous to the antivivisectionist cause, Mme. Huot having boasted of being a freethinker and a socialist, and wildly attacked nearly every prominent scientific man. Continual uproar and disorder prevailed throughout, and the real aim of the meeting was lost sight of, the lecturer's own supporters being disgusted with her absurdities. And yet the antivivisectionists have some ground for their complaint. No one thinks of prohibiting vivisection, but some sort of regulation is not quite unnecessary.

If dogs and cats and the higher animals appeal to our feelings of mercy, the insects as a class generally find but little sympathy. Who has any love for the house-fly, for instance? It is by all conceded to be a plague and a nuisance. But scientists have more serious accusations to bring against it, for the house-fly is known to often be the means of spreading some contagious diseases. And now another charge is added to the list. Drs. Spillmann and Haushalter are of opinion that *flies spread the bacillus tuberculosis*. In a memoir read before the Academy of Sciences they have described experiments made with some of the flies that hover so pertinaciously around the spittoons of tuberculous patients. They have found living Koch's bacilli in both the abdomens of the flies and their excrements, and have no doubt, considering the persistent vitality of the bacillus, that such flies may become active vehicles of the contagion, near and far. As a prevention, they recommend that the spittoons be provided with close covers, and be cleaned with boiling water or a five per cent. solution of carbolic acid.

Some time since allusion was made to the project of coating with sheet lead the inside of the Arcueil aqueduct, which supplies Paris with its purest water—comparatively. The well-known sensitiveness of the public to any possible *lead contamination of drinking-water* stirred up considerable opposition, although chemists had declared beforehand that, considering the composition of the water, no danger could be apprehended. As the metallic lining was absolutely necessary, the work was done; but, to settle the question, a commission, composed of MM. Proust, Gautier, and Schutzenberger, was directed to analyze the water, and report upon its quality after its flow through a mile or so of sheet lead. Without entering into unnecessary chemical details, it may be of some interest to know how the operation was performed. One month was allowed to elapse after the completion of the lining to let things take their natural course. Then the commission collected fifty litres of the water above the

conduit and fifty litres immediately below, and both specimens were treated separately in precisely the same manner. The water, on being evaporated to two litres, let down a precipitate of carbonate of lime, which was separated by decantation; the clear liquid upon further evaporation to half a litre afforded a sediment of sulphate of lime, which was filtered out and preserved. A stream of hydrogen sulphide was now run through the clear liquor, slightly acidulated with acetic acid, and both specimens remained free from colored precipitate or even the faintest brown coloration. The sediments were next examined. On being macerated with dilute acetic acid, a portion was dissolved and a portion remained insoluble. The soluble portion gave for both specimens negative results with hydrogen sulphide. Finally, the insoluble portion, consisting mainly of sulphate of lime, was macerated for twelve hours with a solution of ammonium tartrate, in which sulphate of lead is soluble. Hydrogen sulphide proved that the liquor was equally free from metallic contamination. In consequence the commission, on reporting to the municipal council, gave it as their conclusion that the water of the river Vanne is, so far as lead is concerned, unaffected by its flowing through the Arcueil aqueduct. All chemists knew as much before the analysis was made, but nothing else than so thorough an examination would have satisfied public feeling.

While chemicals are under consideration, it may be well to end with the notice of an interesting discovery about *insoluble salts*, related by MM. W. Spring and G. de Boeck at the last meeting of the Paris Chemical Society. For theoretical reasons they think solubility and insolubility are only relative terms, and depend on several outward causes, hitherto not well understood. However it may be, they have succeeded in preparing *cuprous sulphide soluble* in plain water, and stable enough to bear ebullition and filtration. As the fact is of concern to chemists only, suffice it to say that the sulphide is rendered soluble by prolonged washing, intended to remove the slightest traces of all foreign salts. But another compound interesting to therapeutists is *brown oxide of manganese*, which can also be rendered *soluble* in water by what they call washing *à l'outrance*. The operation is simple enough. MM. Spring and De Boeck prepare brown oxide of manganese by reducing permanganate of potassium with hyposulphite of sodium, and persistently wash the brown precipitate by decantation with distilled water until the oxide redissolves, a fact rendered sensible by the deep brown color of the liquors. The solution thus obtained keeps well for a reasonable time, but is immediately decomposed by filtering, or upon the slightest addition of almost any salt. At the same time, although somewhat different chemically from ordinary brown oxide of manganese, the solution consists of nothing but oxygen and manganese, and may, therefore, find useful applications in therapeutics. It differs thus chemically from the preparation known as dialyzed iron, which necessarily contains a minute proportion of chlorine.

PARIS, August 23, 1887.

PLACENTA PRÆVIA.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—I wish to report a case of placenta prævia that recently came under my care, and also wish to invite whatever criticism any of the readers of the GAZETTE may choose to make in regard to the management of the same, for criticism given in the right spirit is next to advice, and often more valuable to the young practitioner.

The history of the case is as follows:

Mrs. J., aged 38, mother of five children. Was first called to see her June 1, 1887, at 1.30 P.M. She was awakened out of a sound sleep by quite a profuse hemorrhage. I found her very nervous and excited over the occurrence, as she said nothing of the kind had ever happened to her before, and she did not know but she was going to have a miscarriage. The hemorrhage soon ceased, and upon assuring her that I thought that was not the case she became more calm. Upon questioning her, I found that she was somewhere between five and seven months in pregnancy, but could not tell the exact time. Upon examination I found the cervix long and soft, and the finger could easily be passed to the os internum. As this hemorrhage had occurred without any ostensible cause and without warning, I looked at it rather suspiciously. I said nothing though in regard to what I thought, but gave her some advice in regard to future exercise, etc., and left her. On July 15 again, at midnight, I was called to her bedside. Another hemorrhage had occurred in precisely the same manner as before, awakening her out of a sound sleep. This time the hemorrhage was very much greater than before, but not to any alarming extent, as it

ceased spontaneously soon after my arrival. Upon digital exploration I found the vaginal fornix soft and boggy, the cervix long, wide, and soft. There was no doubt in my own mind as to the diagnosis. I frankly told her what I thought the cause of the hemorrhage was, and that rest and quietness on her part was absolutely necessary if she expected to go her full time. On the 17th I was again hastily summoned to see her. She was walking about in the garden when the hemorrhage began. This time it was, indeed, alarming, for she must have lost several pounds of blood by the appearances. On the 18th a consultation was called, and my diagnosis confirmed. The placenta was thought to be nearly central. As Mrs. J. was a strong, healthy woman, my colleague thought by keeping her quiet she might go her full time, as he believed it must be nearly up. The child seemed quite vigorous, and it was decided to let nature take its course for a few days longer, at least, in hopes of saving it if possible. This time the hemorrhage did not cease entirely as before. Notwithstanding she kept her bed for the most of the time, there was a continued oozing and dribbling, especially when she attempted to stand on her feet. At midnight on July 24 I was again called. The hemorrhage had again taken a fresh start. Further delay was useless if the mother's life was to be taken into consideration, and I determined to act at once. As the external os was only dilated to about the size of a quarter of a dollar, I resorted to tamponing. This checked the hemorrhage for the time being and started up the pains. In about four hours I removed the tampon, found the cervix dilated to the extent that two fingers could easily be introduced. I detached the placenta as far as I could reach and ruptured the membranes, and by some external manipulation I brought down the head, this acting as a plug, and as soon as it became fastened in the pelvis the hemorrhage practically ceased. The second stage of labor lasted about an hour. As soon as the child was born the hemorrhage became fearful, and upon examination, to my astonishment, I found another child was there. I immediately introduced my hand into the uterus, ruptured the membrane. The child was lying in the transverse position. I grasped the feet, and brought the trunk down into the pelvis. A few sharp pains and the second child was born. The placenta was removed and the hemorrhage ceased. All antiseptic precautions were used during labor and also afterwards, and my patient made a good recovery. Both children were still-born, and I think by appearances the mother could not have been more than seven and one-half months in pregnancy. I have given a full detail of this case for two reasons,—first, because placenta prævia, and especially with twins, is not a common occurrence; and second, because I never saw the full details of the management of a case in print.

In looking up authorities on placenta prævia I find such men as Thomas, Hoffmann, Barnes, Taylor, Spiegelberg, and others recommend the induction of premature labor as soon as the diagnosis is established.

Ought premature labor to have been introduced in this case as soon as the diagnosis was established, or was the expectant method better until the time came when it was absolutely necessary to act to save the life of the mother? In this case we were in the dark as to the mother's exact time, and also to the fact of there being twins.

Yours respectfully,

F. T. FIELD, M.D.

ELROY, WIS.

GELSEMIUM IN SUN- OR HEAT-STROKE.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—I was called early in July, 1878, one day about sundown, to see a young man, aged 25 years, stricken with heat- or sunstroke; found a crowd of both sexes outside gazing through doors and windows at the sufferer inside, who was bereft of sense and tossing in violent convulsions on the floor; arms and legs like levers governed by steel springs, were flying out, knocking chairs, etc., in all directions, his body rolling and tumbling on the floor.

I directed five men to rush in, seize, and hold him on his back, one man to restrain each limb, and the fifth to hold his body down. Being unsafe to introduce a hypodermic needle into arm, I threw twenty minims F. E. gelsemium into the cellular tissue over the pectoral muscle, and then relieved him of restraint; his violence gradually subsided, and he regained consciousness within half an hour, and one hour afterwards was able to swallow hydr. submur., gr. x, pulv. ipecac., gr. xx, bicarb. soda, gr. x. I then left him, feeling safe as to the result of the emetico-cathartic. The next day's visit found patient completely recovered. No subsequent treatment required. This case might have been serious but for prompt relief. After working hard all

day Saturday he ran over town in the afternoon to lay in supplies for Sunday, hence the overheat.

The wonderful and unmistakably good effects of the gelsemium in this case, and to my observation the close alliance existing, so far as cerebral congestion obtains, in the pathological conditions of the subjects resulting from sunstroke and from opium-poisoning, induced me to adopt this remedy in the treatment of the case of opium-narcosis reported in the June number of the THERAPEUTIC GAZETTE.

In heat-stroke, however, we may surely expect to find the liver greatly engorged and perfectly torpid, hence the indication for an active chlolagogue, the effects of which may be enhanced by combination with ipecac and soda. The ipecac not only relieves the stomach—which may reasonably be considered in a state of atony—of undigested and hurtful substances, but has very calmative and soothing subsequent effects.

Gelsemium may have marked effect on the motor tract of spinal cord, paralyze respiratory nerves, cause certain inferior animals to move backward, and produce death in one-drachm doses, but notwithstanding, when properly administered in *suitable doses proper to the occasion* I have found it invariably an equalizer of the circulatory system and a preventive to local and congestive tendencies. From the stand-point of my personal observation of its physiological effects I would consider it an excellent adjuvant in the early treatment of cerebro-spinal meningitis. In cases of sunstroke there is more than a probability that many perish from neglect or failure to use the lancet freely when indications are most obvious to all but the prejudiced. The pulse should always be the indicator for its use. When the subject of heat-stroke is insensible, or in convulsions, with contracted pupils, flushed face, strong, bounding, or even full pulse, he presents certainly every indication for venesection, and should be bled for effect, and to effect let blood flow until the black begins to turn to red, even though twenty ounces be required. The lancet does not prevent resort to other appropriate measures, such as sponging body, cold to head, hot to feet, etc.; finally, when danger is overcome, by remedies. Stimulants have not been noticed because indications should govern their use. The secretions must not be overlooked, because this is a vital point in restoration.

On the other hand, a cool surface, very feeble or intermittent pulse, pallor, preclude use of lancet, but not gelsemium. In all cases early and prompt treatment is imperative.

W. D. HUTCHINGS, M.D.

MADISON, IND.

WAS IT ANTIFEBRIN?

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—Early Sunday morning, August 14, was called to see a lady suffering with tonsillitis. She was feverish and restless, having slept but little the night previous. Ordered antifebrin in 5-grain doses every four hours. Saw her again in the evening, presenting a cyanosed appearance, lips and fingernails being a dark blue, and numerous bluish spots about the face and neck; pulse 112 and feeble. She had taken three doses,—in all fifteen grains. I discontinued the antifebrin and gave whiskey and digitalis, and the symptoms all disappeared in a few hours.

H. J. WINNETT.

LINCOLN, NEB., August 29, 1887.

"*A NEW REMEDY FOR NIGHT-SWEATS.*"

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—In the August number of the GAZETTE appears a communication from Dr. Sampson Pope concerning "a new remedy for night-sweats." If you will allow me a few words on the subject I will endeavor to show the readers of the GAZETTE and also Dr. Pope that the new remedy will turn out an old acquaintance, only in a new garb. Dr. Pope, after agood deal of circumstantial talk with no particular bearing on the subject, tells us that he got it from an old negro, but he is kind enough to inform us that King recommends it. (Curious! how can it then be new?) The remedy in question I find to be *Potentilla* (tormentilla) *sarmentosa* (canadensis). It is the American analogue to the European *Potentilla tormentilla* (*Tormentilla officinalis*), or tormentil, a drug very rich in two peculiar tannic acids,—the tormentil and kino-tannic acids. Now, I am sure Dr. Pope knows full well that tannic acids of all descriptions have been highly recommended for "sudamina," no matter what is the cause. The active principle of tormentil being its peculiar acids (tannic), it is clear that tannic acid is the principle from which Dr. Pope gets his *wonderful* effects in the *new* (old) remedy. If our new "Sampson" had studied his

therapeutics not from irregulars and quacks and negroes, but from regulars only, in their standard works he would have found on reflection that a few grains of tannic or, still better, gallic acid would have accomplished the same wonderful effect and with more precision than the new godsend, the cinquefoil, can or will do. The *Potentilla* (tormentilla) *sarmentosa* is so similar to the European septfoil, or *Tormentilla officinalis* (*Potentilla tormentilla*), that there can be no reasonable doubts about their analogous therapeutic action. The latter remedy has since time immemorial been in use among the peasantry of Northern Europe for all diseases where an astringent remedy was indicated, and I am positive Dr. Pope will agree with me that sudamina from any cause is one of the conditions in which astringents would be indicated. But among the medical fraternity this old, now obsolete, remedy has had to share the fate of so many other time-honored drugs, namely, oblivion. Although it still keeps its place among recognized drugs in many Pharmacopœias, it is now rarely used by the profession. It has left place for more certain and upon more active and effective based drugs than it; for example, atropine, tannic acid, gallic acid, ergot, agaricine, picrotoxine, etc. Its usefulness was at an end, its doom was sealed, and so I think the new remedy of Dr. Pope will be. There is no need in our armamentarium for rubbish of an obsolete character.

Respectfully,

OSCAR ALF. FLIESBURG, Ph.G., M.D.

HUDSON, WIS., September 4, 1887.

Notes and Queries.

OXYGEN AS AN ANTIPYRETIC.

At the last session of the Royal Academy of Medicine of Madrid, the President introduced an innovation by allowing SEÑOR DON DR. FRANCISCO VALENZUELA, a non-member, to read a paper. The subject was, "The Effect of Oxygen of High Tension upon the Animal Organism," and the amount of original investigation reported in it may well serve to justify the President of the Academy in departing from the time-honored custom of confining the papers and speeches to academicians. Don Valenzuela began his researches by submitting rabbits to pure oxygen at various pressures. No effect on the temperature was produced at a lower pressure than seven hundred and sixty millimetres, or five times the ordinary tension of the oxygen in the atmosphere. Under this, however, a rabbit whose initial temperature was 38.7° C. after an hour's sojourn in the chamber presented a temperature of 37.9° C. At still higher pressures of pure oxygen greater falls of temperature occurred. The highest tension at which experiments were made was fifteen hundred and twenty millimetres; this reduced a rabbit's temperature in an hour from 38.4° to 32.2°. The general effect on the animals of oxygen at the higher tensions was to produce a temporary torpor, and they came out of the chamber covered with moisture; in a very short time, however, they entirely recovered their ordinary condition. Some experiments were also made on the effect of oxygen of high tension on the febrile state, by inducing septicæmia in rabbits and comparing the course of the disease in those which were subjected to the action of oxygen with that in others kept under ordinary atmospheric conditions, with the general result that pyrexia appeared to be reduced by the sojourn in the oxygen chamber. In one case two rabbits were each inoculated with a cubic centimetre of serous fluid with a putrid smell from a dead body. One of them was then subjected for two hours to the action of oxygen of a tension seven times higher than that which it has in the air. Four hours subsequently the temperature showed a reduction of 1.7° C., the temperature of the other rabbit at the same time being 3° C. higher than the normal. The next day the body heat of the first rabbit was 1.5° C. and the second 3.1° C. above the normal. The first was replaced in the oxygen chamber under the same pressure, and for the same length of time as before, which reduced the temperature 2.2°,—that is to say, to 0.7° below the normal. On the third day it was only 1° C. above the normal, while the second rabbit died. No further treatment was resorted to, and on the fourth day the first rabbit had regained its normal physiological condition. It was found in the various experiments made that when a small quantity of septic matter only was introduced, a single session in the oxygen chamber was sufficient to destroy the effect of the virus, but that if a high degree of sepsis was induced the poison was only partially destroyed by a single session. Dr. Valenzuela then made some observations on patients. A young man was attacked by pneumonia, affecting both lungs, on April 26. On the morning of the 27th the temperature was 39.5° C., and in the evening

40.4°. He was then put into the pneumatic chamber containing pure oxygen at a pressure of nine hundred and fifty millimetres, or six times the ordinary tension of atmospheric oxygen, for an hour, after which his temperature was 1.7° C. lower. The next morning it was 39.2°. A second session in the chamber produced no immediate reduction, but four hours later the temperature was 39°. That evening it was 39.5°, and it gradually returned to normal, though no further sessions in the oxygen chamber were ordered. The man made a rapid recovery. Dr. Valenzuela likewise mentioned some other cases of pneumonia and tuberculosis on which the oxygen treatment appeared to have a beneficial action.—*The Lancet*, June 4, 1887.

BUTTER AND OLEOMARGARINE.

The following is quoted from Professor Atwater's article on "The Digestibility of Food," in the September *Century*: "Much has been said and written about the relative digestibility of butter and oleomargarine. The only actual comparative tests on record are a series made with a man and a boy by Professor Mayer, in Holland. In these from 97.7 to 98.4 per cent. of the fat of the butter and from 96.1 to 96.3 per cent. of the fat of the oleomargarine were digested. The average difference was 1.6 per cent. in favor of the butter. Certain possible sources of error in such experiments make it a question whether the digestion was not in fact more nearly complete than even these figures make it. An interesting series of experiments in artificial digestion, conducted by Dr. R. D. Clark, in behalf of the New York Dairy Commission, though of course not affording a definite measure of the process as it actually goes on in the body, accords with the very natural supposition that, in ease, and perhaps in completeness of digestion, oleomargarine would rank between butter and the fat of ordinary meat.

"In chemical composition oleomargarine stands between meat-fat and butter. It will be remembered that oleomargarine is made from beef-fat and lard by removing from them part of the stearin, which counts as the least digestible ingredient, and adding a little butter and sometimes oil, as cotton-seed oil. The bulk of all these fatty substances, meat-fat, butter, and oil, consists of the same or nearly the same kinds of fat, the meat-fat having the more stearin. The butter, however, contains small quantities, seven per cent. or thereabouts, of peculiar fats, butyrin, caproin, etc., which give it its flavor and which are thought by some to make it more easily digestible, especially by persons whose digestion is enfeebled by lack of digestive juices or otherwise.

"In the excitement over oleomargarine legislation the discussion of the relative digestibility of butter and butter substitutes has been made very active by the importance of its bearing upon their comparative values for nutriment, and many statements have been made as to the effect of the chemical composition of the peculiar butter-fats and the consequent chemical changes in the process of digestion and assimilation in the body. It is interesting to compare the very positive inferences which some writers upon the subject draw from experimental investigations, with the very guarded expressions of opinion made by the authors of the same investigations in their writings and in personal conversation. The facts at hand and the general impression of special students of these subjects, so far as I have observed, are to the effect that probably, for healthy persons, the difference between butter and oleomargarine in ease and in completeness of digestion would be at most very slight, but that for people with enfeebled digestion and for infants, butter may, perhaps, at times, have the advantage."

NEW TEST FOR MILK.

A new test for water—that is, pump-water—in milk has recently been proposed by Herr Szilasi. This depends on the fact that sulphate of diphenylamine is colored blue by the action of an exceedingly dilute solution of a nitrate. As well-water always contains more or less nitrate, its presence in milk can be detected. The test is carried out thus: Twenty minims of sulphate of diphenylamine is placed in a small porcelain vessel, and a few drops of the milk which is to be examined added to it. If this contains even five per cent. of average well-water, a blue tinge will gradually distinctly appear. Sulphate of diphenylamine is easily procurable, and only costs about sixpence an ounce, so the test may be readily tried.—*The Lancet*, June 11, 1887.